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A REFERENCE MANUAL

FOR THE

ADMINI STRATOR

OF AN

INDUSTRIAL HYGIENE SURVEY

Prepared by The Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service. Tiv. of Industrial Hygiene.

# RA 427

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#### PREFACE

This manual is intended to be of assistance to the Health Officer responsible for making a preliminary survey of industrial health conditions in a State, county, city or large industrial group. It is not presented as a finished manual of instructions, but rather as a guide and reference for a person already familiar with the purposes and desired results of industrial hygicne surveys. Before attempting to use this manual, one should familiarize himself with Public Health Bulletin No. 236, and the published reports of industrial hygiene surveys in various States.

This manual consists of first, a brief summary of hints and suggestions for inaugarating an industrial hygiene survey; second, a list of desired office and field supplies for carrying out the survey; third, examples of industrial classifications, survey manuals and forms, and fourth, a list of suggestions for organizing the operations in the survey office, and other material necessary in making an industrial hygiene survey. The survey supervisor should become familiar with the material in this manual and its location before inaugurating the survey.

A. Obtain a list of all industries and service establishments in the area to be surveyed (see paragraph "C"). Group these establishments on the basis of the classification used by the United States Census Bureau (see page 61, Public Health Bulletin No. 236, June 1937. Classification included in this manual as "Classification of Industries"). This code is now being used as the basis for all United States industrial surveys.

As an aid in classification, refer to the alphabetical list of industries in the 15th Census of the United States (page 33, Industry Index). A copy of this more detailed break-down of the industrial classification, with suggested corrections, has been included under the heading "Industry Index".

B. Next decide what industries it is desirable to survey. Duplication of studies already done by the Labor Department, Bureau of Mines, etc., should be avoided. Industrial groups which may safely be omitted from the survey are marked with an asterisk (\*) in the "Classification of Industries".

IMPORTANT: Be sure that industrial grouping is representative and all industries selected for survey are proportionately represented.

C. Obtain name of plant, working population and product manufactured so that each plant may be placed in the proper survey group. Possible sources for this information are:

> Unemployment Compensation Office Workmen's Compensation Board Licensing Boards Manufacturing indices Local board of trade or chamber of commerce City directories Telephone directories (as last resort or for purposes of checking other sources)

- D. Make an index card for each plant, showing name, address, working population, product manufactured and, if possible, name of official in charge.
- E. Code cards according to the chief product manufactured in the represented plant.
- F. Prepare an alphabetical list of all plants in the survey area to be used as a reference directory. This should be done before

the sample is selected and will necessitate throwing the index cards in alphabetical order. This work may appear unnecessary but will serve to eliminate duplicate cards and the resulting list will be invaluable as the survey progresses.

- G. Decide on minimum plant population to be surveyed and separate all plant cards showing less than this number. For example, if a minimum of 5 is selected, the cards for all plants employing 4 or less workers should be placed in a separate file.
- H. All plant cards should be sorted. Those selected for survey should be filed in one group and those discarded due to small number of employees in a second group. Sort cards according to code number (based on industrial classification of product manufactured) and determine the total number of plants and the total working population in each group, i.e., under each code number. Tabulate plants according to industry and population for later comparison with Census figures in the same groups. The following is an example of a tabular form which can be used.

	(1)	(2)	(3)
	Under Min. Linit	Over Min. Limit	Consus
Industry	Plants Pop.	Plants Pop.	Plants Pop.

This tabulation will enable one to detect omissions in the lists.

I. Compare populations and number of plants falling below and above the lower limit figure decided upon, and do this for each industrial group. This is done to determine whether or not the lower limit has been correctly selected. If a large percentage of the total working population are employed in plants which fall below the selected limit, a representative sample of the shaller plants should be surveyed so that the working population will be reasonably covered. Determine the size of the sample to be surveyed after taking into consideration the time, funds and personnel available to make the survey, the homogeneity of each industrial group and the similarity between the prepared industrial index and the Consus data covering the same industries. It may be advisable to vary the percent of plants surveyed in different groups. A survey of 50 to 100% of the plants is desirable in a diversified or small industrial group, while a 25 or 33 1/3% sample may be adequate in a large homogeneous group.

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Large samples are frequently desirable in industries where processing methods vary between different plants.

- J. Select the sample by drawing every 2nd, 3rd, or <sup>4</sup>th, etc., card from the index file for each industry. Check sample by totaling plants and population in the sample groups, and compare these figures with the total number of plants and population in each group, to be sure that you have taken as large a percentage as you desired. The sample should always be larger than the desired percentage, since a complete survey of all selected plants is selden possible, and some surveys will have to be omitted or discarded.
- K. Divide the index cards representing plants selected for survey according to geographical location, since this will facilitate the surveying procedure. The index cards which were not selected in the survey sample should be filed according to industrial classification.

NOTE: As stated later, the index card for each plant should be attached to the survey when it is received at the office, and will follow it through the tabulating procedure. After the survey has been coded and tabulated, this index card representing a complete survey will be filed according to industrial classification.

- L. Make up a form letter to be sent as an individual letter to each plant manager a week or ten days before the plant is to be surveyed, to permit a reply from the plant manager and additional correspondence, if necessary. (An example of a typical introductory letter is included later. Modifications of this letter to fit individual conditions will be necessary in the case of each survey.)
- M. Proparation of forms for collecting survey data (examples included).

Forms

1 and 2  $\sim$  Both of these forms can be mineographed on one 3 x 5 card.

Form 1 should show name of plant, product, and working population. Form 2 shows additional data required from the plants surveyed. Reference: Forms 1 and 2, Bulletin 236.

3 - Industrial health services for plant as a whole. Reference: Form 3, Bulletin 236, and including samples of selected State surveys.

\* 

4 - Workroom survey data similar to Form 4 included in this manual.

5 to 9, inclusive - are tabulation forms. Representative examples of these forms are included in this manual.

NOTE: Form 10 is a tabulation form for venereal disease information as used in the Colorado industrial hygiene survey, and is adaptable if such information is collected in the survey.

- N. Propare a manual of instructions for the people who will actually make the surveys of the plants. This will explain the entries to be made on Forms 3 and 4, and will outline a suggested procedure for making the surveys. (Example of survey form included in this manual.)
- 0. Before making any surveys, assemble the surveyors and explain the procedure for making the surveys, discussing the manual in detailed lectures. It will also be desirable to supervise each surveyor on his initial surveys.
- P. Assemble a good library for the editor. The list given in Appendix C of Bulletin 236 should serve as a minimum requirement for such a library.
- Q. Selection of Personnel: The requirements for the personnel making the survey in order of importance are:
  - 1. Surveyors should be intelligent, observing and tactful.
  - 2. They should be familiar with industrial plants and processes.
  - 3. They she the have had experience in public health work and should know the policies of the department responsible for the survey.
  - 4. If possible, they should be trained chemical or public health engineers. It will be desirable for the person in charge of the survey not only to give a thorough course of instruction prior to the survey, but also to issue periodic instructions during the survey as the need for such instruction becomes evident while editing the surveyors' reports (forms 3 and 4).
- R. When a plant selected for survey is found to be closed, or when for reasons beyond the surveyor's control a survey cannot be made, another plant should be drawn from the original list and substituted for the inactive plant. It may also be desirable to substitute a similar plant for an isolated plant in an outlying district, since this preliminary survey is primarily a

fact-finding procedure concerned with the type and number of industries, the industrial population and the material exposures which will be encountered by this population. Substitution will, of course, be impossible where a survey of 100% of the plants in any one group is desired, or where measurements are being made to determine the existence of actual exposures, controlled or otherwise, but substitution is permissible where the survey is intended merely to determine the possible existence of a health hazard in an industry group.

- S. Emphasize to surveyors that they should make a flow-sheet for each sizeable plant, showing the progress from raw material through the various processes to the finished product, and that they should, if possible, make the survey of workrooms following the flow-sheet order.
- T. A survey supervisor should make a list of plants assigned to each surveyor and keep a daily record of the surveys returned by each surveyor. A daily record of reports tabulated can also be incorporated on this same form. An example of the office record form used in some States is given below.

Antipender und de Karner under gestie gepennige	Plants	Plants	Plants	Plants closed
Date	allotted	Surveyed	Tabulated	or too small
	1991 - 1992 - 1992 - 1992 - 1994 - 1995 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 -			to survey

U. Publicity: A policy with regard to publicity should be adopted with the approval of the State Health Commissioner. All matters, such as radio talks, newspaper releases and general information to the public through departmental news letters, etc., should be determined at this time. It has been the experience in most States that a minimum of publicity is desirable, but local conditions must be considered in every case.

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Materials and Supplies Needed for a State Wide Industrial Hygiene Survey. (Figures refer to supplies needed for a 30% survey of 1000 establishments and should be proportionately increased for larger surveys.)

OFFICE AND FIELD SUPPLIES.

1500 plain white file cards (3" x 5" suggested)

200 index cards, 1/3 cut (3" x 5")

file boxes for above cards

- 4 doz. pencils, 2H (2 doz. for surveyors)
- 1/2 doz. red pencils
- 1/2 doz. blue pencils

1000 paper clips

300 file folders (letter size)

100 Manila envelopes, large size (if needed )

2 doz. Mimcograph stencils (for forms and manual)

500 Letterheads (for introductory letters)

- 500 Official envelopes
- 500 Stamps ( $2\phi$  and  $3\phi$  as necessary)
- 200 Carbon paper sheets (Same size as survey forms)

24 Pads scratch paper

Stenographers notebooks, wastebaskets, inkwells, lamps, bond and copy paper, erasers, rubber bands, etc.

Clip boards (one per surveyor)

Mimeographed or printed forms as follows:

2000 -	form 3	1500 - form 7	100 - form A
7500 -	form 4	500 - form 8 (if used)	100 - form B
500 -	form 5	1500 - form 9	100 - form C
500 -	form 6	500 - form 9a (if used)	100 - form D

Minimum Office Equipment:

Typewriter Desk (Stenographer's Desk) Large office desk Large Table Chairs for office personnel Typewriter Adding machine (Electrical preferred) Calculating machine (Munroe or equivalent) File cabinet, letter size, four drawer unit. Stapling machine (paper fastener)

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#### CLASSIFICATION OF INDUSTRIES

#### AGRICULTURE, FISHING & FORESTRY

#### Symbol

- \* VV Agriculture
- \* VO Fishing
- \* VI Forestry

#### EXTRACTION OF MINERALS

- V2 Coal mines
- V3 Copper mines
- V4 Gold & silver mines
- V5 Iron mines
- V6 Lead and zinc mines
- V7 Other specified mines
- V8 Not specified mines
- V9 Quarries
- XV Oil wells & gas wells
- Salt wells & works XO

# MANUFACTURING & MECHANICAL INDUSTRIES

\* XI Building and construction industry

#### CHEMICAL AND ALLIED INDUSTRIES

- X2 Charcoal & coke works
- X3 Explosives, ammunition, and fireworks factories
- X4 Fertilizer factories
- X5 Gas works
- X6 Paint & varnish factories
- X7 Petroleum refineries
- X8 Rayon factories
- X9 Soap factories
- OV Other chemical factories
- 00 Cigar and tobacco factories

#### CLAY, GLASS AND STONE INDUSTRIES

- Ol Brick, tile, and terra-cotta factories
- 02 Glass factories
- 03 Lime, cement and artificial stone factories
- 04 Marble & stone yards
- 05 Potteries

\* Not needed

2V Other Clay, Glass & Stone

#### CLOTHING INDUSTRIES

- 06 Corset factories
- 07 Glove factories
- 08 Hat factories, felt
- 09 Shirt, collar & cuff factories
- IV Suit, coat & overall factories
- 10 Other clothing factories

#### FOOD AND ALLIED INDUSTRIES

- 11 Bakeries
- 12 Dairy products
- 13 Candy factories
- 14 Fish curing & packing
- 15 Flour and grain mills
- 16 Fruit & Veg. canning, etc.
- 17 Slaughter & packing houses
- 18 Sugar factories & refineries
- 19 Other food factories
- 20 Liquor and beverage industries

#### IRON AND STEEL, MACHINERY AND VEHICLE INDUSTRIES

- 21 Agricultural implement factories
- 22 Automobile factories
- 23 Automobile repair shops
- 24 Blast furnaces and steel rolling mills
- 25 Car and railroad shops
- 26 Ship & boat building
- 27 Wagon and carriage factories
- 28 Other iron and steel and machinery factories
- 29 Not specified metal industries

#### METAL INDUSTRIES EXCEPT IRON AND STEEL

- 3V Brass Mills
- 30 Clock and watch factories
- 31 Copper factories
- Gold and silver factories
- Jewelry factories
- 32 33 34 Lead & zinc factories
- 35 Tinware, enamelware, etc. factories
- 36 Other metal factories

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#### LEATHER INDUSTRIES

- 37 Harness & saddle factories
- 38 Leather belt, leather goods, etc. factories
- 39 Shoe factories
- 40 Tanneries
- 41 Trunk, suitcase, and bag factories

#### LUMBER AND FURNITURE INDUSTRIES

- 42 Furniture factories
- 43 Piano and organ factories
- 14 Saw and planing mills
- 45 Other woodworking factories

# PAPER, PRINTING AND ALLIED INDUSTRIES

- 46 Blank book, envelope, tag, paper bag, etc. factories
- 47 Paper and pulp mills
- 48 Paper box factories
- 49 Printing, publishing and engraving

#### TEXTILE INDUSTRIES

- 5V Cotton mills
- 50 Knitting mills
- 51 Silk mills
- 52 Textile dycing, finishing, and printing mills
- 53 Woolen & worsted mills

#### OTHER TEXTILE MILLS

- 54 Carpet mills
- 55 Hemp, jute & linen mills 56 Lace & embroidery mills
- 57 Rope and cordage factories
- 58 Sail, awning, and tent factories
- Other and not specified 59 textile mills

#### MISCELLANEOUS MANUFACTURING INDUSTRIES

- 60 Broom & brush factories
- 61 Button factories
- 62 Electric light & power plants
- 63 Electrical machinery and supply factories
- 64 Independent hand trades
- 65 Rubber factories
- 66 Straw factories
- 67 Turpentine farms & distilleries
- 68 Other miscellaneous industries
- 69 Other not specified industries

#### TRANSPORTATION AND COMMUNICATION

- \* 70 Air transportation
- \* 71 Construction and maintenance of streets, roads, sewers, bridges
- \* 72 Express companies
  - 73 Garages, automobile laundries greasing stations
- 74 Livery stables \*
- 75 \* Pipe lines
- \* 76 Postal service
- \* 6V Radio broadcasting and transmitting Steam railroads 77
  - 78 Street railroads
- \* 79 Telegraph and telephone
- \* 8V Truck, transfer & cab companies
- \* 80 Water transportation
- \* 81 Other and not specified transportation and communication
- \* TRADE
  - 82 Advertising agencies
  - 83 Banking and brokerage
  - 84 Grain elevators
  - 85 Insurance
  - 86 Real Estate
  - 87 Stockyards
  - 88 Warehouses, & cold storage plants

# WHOLESALE AND RETAIL TRADE

- 89 Automobile agencies, stores, filling stations
- \* Not needed.

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WHOLESALE AND RETAIL TRADE
  (Except Automobile)
  90 Wholesale and retail trade
      (except dealers and except
       laborers in coal and lumber
       yards.)
  91 Wholesale and retail dealers
        and laborers in coal and
        lumber yards
  92 Other and not specified trade
PUBLIC SERVICE
  (Not elsewhere classified)
 7 V
     Recreation and amusement
 94 Professional pursuits
* 95
     Semi-professional pursuits
        and attendants and helpers
     Hotels, restaurants, boarding
 97
       houses, etc.
* 96
     Domestic and personal service
        (not elsewhere classified)
  97
     Laundrics
     Cleaning, dycing and pressing
  98
        shops
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NOT SPECIFIED INDUSTRIES AND SERVICES

- 99 Not specified industries and services
- \* Not needed

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#### TALLEY SHEET

#### INDUSTRIES IN INDIANA - CLASSIFIED

#### EXTRACTION OF MINERALS

- V2 Coal Mines
- VSA Sand and Gravel
- VSB Limestone
- XV Oil and gas wells

#### MANUFACTURING AND MECHANICAL INDUSTRIES

Chemical and Allied Industries:

- X2 Charcoal & Coke Works
- X3 Explosives, Ammunition & Fireworks Factories
- X4 Fertilizer factories
- X5 Gas Works
- X6 Paint & Varnish Factories
- X7 Petroleum Refineries
- X8 Rayon Factories
- X9 Soap Factories
- OV Other Chemicals
- OVA Baking Powder
- OVB Blacking, stains, etc.
- OVC Carbon Paper, Ink
- OVD Chemicals
- OVE Compressed Gases
- OVG Drugs, Patent Medicine
- OVH Glues, Paste
- OVI Greases, Tallow

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# OTHER CHEMICALS (Continued)

- OVJ Oils, Not Pet.
- OVK Perfumes, Cosmetics
- OVL Other chemicals
- OO CIGAR & TOBACCO FACTORIES

# CLAY, GLASS & STONE INDUSTRIES

- Ol Brick, tile, torra cotta
- 02A Mirrors
- 02B Other glass factories
- 03A Cement
- 03B Other
- 04 Marble & stone yards
- 05 Potteries
- 2VA Roofing Asphalt
- 2VB Asbestos products
- 2VC Grinding wheels, sandpaper
- 2VD Other clay, glass & stone rock wool

# CLOTHING INDUSTRIES

- 06 Corset factories
- 07 Glove factories
- 08 Hat factories (felt)
- 09 Shirt, collar and cuff
- IV Suit, coat and overall
- 10A Women's furnishings
- 10B Fur clothing

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#### FOOD & ALLIED INDUSTRIES

- 11 Bakeries
- 12 Butter, cheese and milk
- 13 Candy factories
- 14 Fish curing & packing
- 15 Flour & grain mills
- 16 Fruit & vegetable canning, etc.
- 17 Slaughter & packing houses
- 18 Sugar factories & refinerics
- 19A Ice manufacturing
- 19B Spices, coffee
- 190 Other
- 20A Liquor & beverage industries (soft)
- 20B Alcoholic beverages

# IRON & STEEL MACHINERY AND VEHICLE INDUSTRIES

- 21 Agricultural implement factorics
- 22 Automobiles
- 23 Auto repair shops
- 24B Blast furnaces & steel rolling mills (except wire)
- 24A Wire mills
- 25 Car and railroad shops
- 26 Ship and boat building
- 27 Wagon and carriage
- 28A Air craft
- 28B Foundries

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#### IRON & STEEL MACHINERY AND VEHICLE INDUSTRIES (Continued)

- 280 Machine shops
- 28D Small machinery implements and cutlery
- 28E Heavy machinery
- 28F Other
- 29 Not specified metal industries

#### METAL INDUSTRIES, EXCEPT IRON AND STEEL

- 3V Brass mills, musical instruments
- 30 Clock and watch factories
- 31 Copper factories
- 32 Gold & silver factories
- 33 Jewelry factories
- 34 Lead and zinc factories
- 35 Tinware, enamelware, etc.
- 36A Aluminum
- 36B Metal specialties, novelties
- 36C Other
- 36D Electro plating, metal finishing

#### LEATHER INDUSTRIES

- 37 Harness and saddle
- 38 Leather belt, leather goods, etc.
- 39 Shoe factories
- 40 Tanneries

t

41 Trunk, suitcase and bag

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#### LUMBER & FURNITURE INDUSTRY

42A Furniture factories

42B Caskets

- 43 Piano and organ
- 44 Saw and planing mills
- 45 Other woodworking

# PAPER, PRINTING AND ALLIED INDUSTRY

46A Blank book, envelope, tag, paper bag, etc.

46B Wax paper

46C Wallpaper

- 47 Paper and pulp mills
- 48 Paper box factories

49A Book binding

- 49B Engraving and developing
- 490 Lithographing
- 49D Newspaper
- 49E Stereotype
- 49F Other

#### TEXTILE INDUSTRIES

- 5V Cotton mills
- 50 Knitting mills
- 51 Silk mills
- 52 Textile dyeing, finishing and printing mills
- 53 Woclen and worsted mills
- 54 Carpet mills

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#### OTHER TEXTILE MILLS

- 55 Homp, jute and linen mills
- 56 Lace and embroidery mills
- 57 Rope and cordage factories
- 58 Sail, and awning and tent
- 59 Other and not specified textile mills

#### MISCELLANEOUS MANUFACTURING INDUSTRIES

- 60 Broom and brush
- 61 Button factories
- 62 Electric light and power
- 63A Batteries
- 63B Lamps
- 630 Other
- 64 Independent hand trades
- 65 Rubber factories
- 66 Straw factories
- 68A Dental appliances and supplies
- 680 Sign
- 68D Toys and novelties
- 68E Hair goods, artificial flowers
- 68F Lenses
- 68G Lamp and window shades
- 68H Other not specified

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### PERSONAL SERVICE

- 97 Laundries
- 98 Cleaning, dyeing and pressing shops

#### MANUFACTURING & MECHANICS

#### EXTRACTION SERVICES

PERSONAL SERVICES

GRAND TOTAL

Syrı-		Sym-			
bol	Industry	bol	Industry		
7	A				
17	Abattoir	οv.	Axle grease		
2 V	Abrasives	36	Babbitt metal, white metal,		
ΟV	Acids		type metal, and solder		
2 8	Adding machines	27	Baby carriages		
82	Advertising agency	59	Bags (except paper and leather)		
1	)Paper-46	41	Bags (leather)		
- ).	Advertising novelties)Metal-36		Bags (paper)		
04	Agateware	ΟV	Bakelite		
21	Agricultural implements	11	Bakery		
28	Aircraft and parts	O V	Baking powder		
70	Airport or air transportation	68	Band and orchestral instruments		
ΟV	Alcohol	83	Banking and brokerage		
19	Alfalfa mill	24	Bar, beam, or bloom nill		
OV	Alum	2'8	Barbed wire		
36	Aluminum	45	Barrels (Metal - 28)		
36	Aluminum ware	V 7	Barytes mine		
X 3	Ammunition	45	Baskets		
28	Apiarists' supplies	63	Battery factory		
63	Arc and incandescent lamps	23	Battery station or shop		
68	Art goods (except statuary)	V 7	Bauxite mine		
68	Artificial feathers	68	Bead work		
68	Artificial flowers	47	Beaver board factory		
56067	Artificial leather	59	Bedding factory		
68	Artificial linbs Artificial stone	3 ₹	Bells		
6'8	Artists' materials Asbestos mine	38	Belting (leather)		
			Belting $(n \cdot s \cdot 1)$		
2 V	Asbestos products	65	Belting (rubber)		
V 7	Asphalt nine	5 V	Belting (textile)		
2 V	Asphalt works	24	Bessemer converter		
68	Athletic goods	20	Beverages		
28	Augers and bits	28	Bicycles		
89	Automobile agency or	42	Billiard tables and materials		
	accessories store	OV	Blacking, stains, and dressings		
22		46	Blank books		
22	Automobile factory	53 24	Blankets and steamer rugs (wool)		
59	Automobile filling station		Blast furnace		
73	Automobile laundry or	52	Bleachery (textile)		
	greasing station	ΟV	Bleaching materials		
23	Automobile repair shop	10	Blouses or shirt waists		
89	Automobile service station	ΟV	Blue vitriol		
	(filling station)	ΟV	Blueing		
23	Automobile service station	26	Boat building		
	(repair shop)	5 &	Boiler shop		
ຮ 9	Automobile store	2 g	Bolts, nuts, washers, and rivets		
22	Automobile truck factory	0 V	Bone black		
2 2 5 8	Awning factory	49	Bookbinding		
28	Axes and hatchets	39	Boot and shoe cut stock		
1					

l Not specified.

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Sym-		Sym-			
bol	Industry	bol.	Industry		
3 3 3 3 5 5	Boot and shoe findings	68	Cameras and kodaks		
39	Boots (felt)	35	Can factory		
39 65	Boots and shoes (leather)	ΟV	Candles		
65	Boots and shoes (rubber)	13	Candy		
0 V (	Borax factory	68	Canes (wooden-45)		
V 7	Borax mine	16	Cannery (fruit and vegetable)		
	Bottle caps and scals Paper_46	25	Car or railroad shop		
	Paper_46	25	Car wheel works		
02	Bottle factory	0 V (	Carbide works		
20	Bottling works (n.s.1)	0 V (	Carbon		
42	Bowling alleys and accessories	0 V	Carbon black		
4.7	Box board factory	0 V	Carbon paper		
ц Ц	Box shooks	2 V	Carborundum mill		
44	Boxes (cigar)	46	Card cutting and designing		
48	Boxes (paper)	46	Cardboard		
14 14	Boxes (wood)	54	Carpet mill		
59 28	Braids	54	Carpets, rag		
28	Brake shop	27	Carriage and wagon materials		
68	Brands	27	Carriages and sleds, children's		
3 V	Brass factory or foundry	27	Carriages and wagons		
06	Brassieres	X 3	Cartridges		
15	Breakfast foods	28	Cash registers		
20	Brewery	42	Caskets and accessories		
01	Brick factory or yard	28	Cast iron pipe		
71	Bridge construction or	28	Castings (iron)		
	maintenance	0 V (	Celluloid novelties		
28	Bridge works	ΟV	Cellulose products		
2 V)		47	Celotex factory		
or (]	Briquettes		Cement and gypsum		
0 3)		03	Cement block factory		
36	Britannia factory	03 03 15	Cereals and breakfast foods		
83	Brokerage	32	Chains (gold or silver)		
60	Brooms and brushes	28	Chains (iron)		
2 8	Buckles (iron)	36	Chains (n.s. <sup>1</sup> )		
28	Builders' hardware	36	Chandeliers		
83	Building and loan association:	42	Chair factory		
Xl	Building industry	04	Chalk		
55	Burlap	X 2	Charcoal and coke		
12	Butter and butter reworking	12	Cheese		
19	Butterine factory	οv	Chemical laboratory		
61	Buttons	O V	Chemicals		
8 V	Cab company	13	Chewing gum		
42	Cabinet factory	05	China decorating		
28	Calculating machines	05	Chinaware		
49	Calendars (printed)	28	Chisels and planes		
5 V	Calico factory	V7	Chloride mine		
	1				

· lNot specified.

Crow		Crow	
Sym- bol		Sym- bol	Industry
T	Industry		industry
19	Chocolate and cocoa	45	Cooperage or cooper shop
19	Cider	31	Copper factory or refinery
0 0	Cigars and cigarettes	v 3	
V7	Cinnabar mine	3 Í	Copper smelter
05	Clay factory or yard	ó v	Copperas
98	Cleaning, dyeing or pressing	57	Cordage and twine
) 0	shop	1 9	_
VÖ	Cleansing preparations		Corduroy
30	Clock and watch materials	4 5	Cork cutting
30	Clocks and watches	35	Cornices - material
52	Cloth sponging and refinishing	Ó Ó	Corsets and brassieres
28	Clothes wringers	οv	Cosmetics
10	Clothing (except suits, coats,		Cotton batting
	cloaks, and overalls)	52	Cotton finishing mill
ιV	Clothing (suits, coats, cloaks,	68	
<u> </u>	and overalls)	5 V 6 8	Cotton mill
68	Clubs, golf and Indian	68	Cotton press or compress - 28 if
Ϋ2	Coal mine		press mfg.
ΟV	Coal tar products	ΟV	
lV	Coat factory (fabric)	11	Crackers
10	Coat factory (fur)	28	Cranes
1 V	Coat factory (leather or	44	Crates
	leatherette)	68	Crayons
65	Coat factory (rubber)	οv	Cream of tartar
V 7	Cobalt mine	28	Cream separators
19	Cocoa factory	12	Creamery
19	Coffee roasting and grinding	OV	Creosote
42	Coffins and burial cases	24	Crucible furnace
Χ2	Coke Works	05	Crucibles
88	Cold storage plant	35	Culvert factory
09	Collars and cuffs		(metal-28 or 3
9 Ĭ4	College or university		Curtain rod factory-(wood - 45
οv	Combs and hairpins (celluloid)	28	Cutlery and edge tools
69	Combs and hairpins (except	ΟV	Cyanides
-	celluloid, metal, and rubber)	28	
69	Combs (material n.s.1)	68	Dental goods or instruments -
65	Combs (rubber)		material
59	Comforts and guilts	4 2	Desk factory
59 83	Commission house or company	20	Distillery (liquor)
03	Concrete products	80	Dock construction
12	Condensed milk	44	Door and window screens (wood)
13	Confectionery	28	Doors and shutters (iron)
Xĺ	Construction work (building)	44	Doors and shutters (wood)
80	Construction work (dock, levee,	10	Dress factory
	wharf)	56	Dress trimmings, etc.
		21	Drills (agricultural implements)
71	Construction work (street, road,	<u> </u>	STITED (SETERATOR INTERNIER)
71	Construction work (street, road, sewer, or bridge)	10 56 21 0V	Drug grinding
71	Construction work (street, road, sewer, or bridge)	ΟV	

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Sym-	Tuda at me	Eym- bol	Industry
bol	Industry	001	Industry
οv	Druggists' preparations	x 4	Fertilizer factory
	Dry ice	4 7	Fiber board factory
x 6	Dryers (paint)	6 1	
	Dychouse	55	Files
98	Dyeing and pressing shops	x 6	
o v	Dyestuffs, mordants, and sizes	0 V	Films or camera
X 3	Dynamite	28	
63	Dynamos	28	
05	Earthen and stone warc	28	
59	Elastic woven goods (weaving)	28	0
5963	Electric heating apparatus	X 3	
62	Electric light or power plant	6 8	
63	Electric lighting fixtures	14	Fish curing and packing
7 8	Electric railway	59	
63	Electric signs	19	Flavoring extracts
63	Electrical machinery, apparatus,		
	and supplies	55 44	Flooring mill (wood)
36	Electroplating $(n \cdot 0 \cdot s \cdot 2)$	15	Flour or grain mill
28	Elevators (passenger and freight)	7 0	
g 4	Elevator (grain)	19	Food preparations $(n \cdot c \cdot c \cdot 3)$
56	Embroideries	v 1	Forestry
2 V	Emery and other abrasive wheels	28	Forging factory
V7	Emery mine	3 V	
2 V	Emery paper and cloth	28	
	Enameled ware	29	
35	Enameling $(n \cdot 0 \cdot s \cdot 2)$	68	
35 35 23	Engines, steam, water, and gas	4 5	
6 8	Engravers' materials	28	Freg shop
49	Engraving, steel and copper plate	1 . i	
49	Engraving, wood	16	
49	Engraving and diesinking	68	Fuel, manufactured
_	$(n_{\bullet 0}, s_{\bullet}^{2})$	10	Fur coats
46	Envelopes	10	Fur goods
45	Excelsior mill	28	Furnaces (for heating buildings)
X 3	Explosives	10	
	Express company (any)	4 2	
69	Factory (not specified)	10	Furs, dressed
68	Fancy articles (n.o.s. <sup>2</sup> )	X 3	Fuse
2 9 8 8 8 8 6 6 6 6 6	Featherbone factory	28	
68	Feather pillows and beds	6 8	
68	Feathers and plumes	73	Garage
15	Feed mill	V 7.	Garnet mine
15 74	Feed stable	10	
391	Felt and wool boots and shoes		
0 8	Felt hats		Gas machines
53	Felt or felt mill	28	Gas meters and water meters
1 <sup>1</sup> ]	Not specified. <sup>2</sup> Not otherwise	pecif	fied. <sup>3</sup> Not elsewhere classified.
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<ul> <li>2 S Locomotives</li> <li>2 S Locomotives</li> <li>4 J Log or lumbor camp</li> <li>4 5 Looking-glass and picture frames</li> <li>6 S Miscellaneous manufacturing (n.e.c.3)</li> <li>Models and patterns (except paper patterns)</li> <li>2 S Looking-glasses</li> <li>2 S Looking-glasses</li> <li>2 S Looking-glasses</li> <li>2 S Looking-glasses</li> <li>3 Molels and patterns (except paper patterns)</li> <li>4 H Lumber mill</li> <li>4 H Lumber or log camp</li> <li>6 V Lye</li> <li>7 V Molonsers</li> <li>8 Machine shop</li> <li>8 Machine tools</li> <li>8 Machine tools</li> <li>8 Machine tools</li> <li>9 Motion picture films</li> <li>6 S Motion picture machines</li> <li>2 S Machine tools</li> <li>8 Machine tools</li> <li>9 Motors</li> <li>9 Motors</li> <li>9 Motors</li> <li>9 Motors</li> <li>9 Motors</li> <li>9 Motors</li> <li>9 Manufacturing (not specified)</li> <li>9 Marble or stone yard</li> <li>9 Matches</li> <li>9 Mats and matting (from cocoa fiber or grass)</li> <li>6 Matche</li> </ul>	3 V			, ,		
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4 4       Lumber mill       0 4       Monuments and tombstones         V 1       Lumber or log camp       5 9       Mops and dusters         0 V       Lye       4 0       Morocco factory         1 9       Macaroni       5 V       Mosquito netting         2 8       Machine shop       7 V       Motion picture films         2 8       Machine tools       6 8       Motion picture machines         2 8       Machinery (all used in manu-facturing)       2 8       Motor boats         6 8       Mail bag repairing       6 3       Motors         7 6       Mail transportation       0 V       Mucilage and paste         2 0       Malt       6 8       Musical instruments and material         7 7       Manganese mine       6 8       Musical instruments and material         6 9       Manufacturing (not specified)       0 V       Musical instruments (not specified)         0 4       Marble, granite, slate, and other stone products       5 9       Narrow fabrics (cotton)         0 4       Marble or stone yard       0 9       Neckties or neckwear         2 6       Masts, spars, oars, and rigging       2 8       Needles, pins, hooks, and eyes         5 7       Nets or seines       9       Newspap						
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0 VLye4 0Morocco factory1 9Macaroni5 VMosquito netting2 8Machine shop7 VMotion picture films2 8Machinery (all used in manu- facturing)2 6Motor boats6 8Mail bag repairing6 3Motors7 6Mail transportation0 VMucilage and paste2 0Malt6 8Musical instruments and material. (material) (n.o.s. <sup>2</sup> )6 9Manufacturing (not specified)2 8Nails0 4Marble, granite, slate, and other stone products5 9Narrow fabrics (n.s. <sup>1</sup> )0 4Marble or stone yard0 9Neckties or neckwear2 6Masts, spars, oars, and rigging2 8Needles, pins, hooks, and eyes5 9Mats and matting (from cocoa fiber or grass)3 6Nickel		Lumber mill	1 1	Monuments and tombstones		
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<ul> <li>2 8 Machine shop</li> <li>2 8 Machine tools</li> <li>2 8 Machinery (all used in manu- facturing)</li> <li>2 8 Mathinery (all used in manu- facturing)</li> <li>2 8 Motor boats</li> <li>2 8 Motorcycles</li> <li>6 3 Motors</li> <li>6 3 Motors</li> <li>7 6 Mail transportation</li> <li>2 0 Malt</li> <li>2 0 Malt</li> <li>2 8 Musical instruments and material (material) (n.o.s.<sup>2</sup>)</li> <li>6 9 Manufacturing (not specified)</li> <li>0 4 Marble, granite, slate, and other stone products</li> <li>4 Marble or stone yard</li> <li>5 9 Mats and matting (from cocoa fiber or grass)</li> <li>7 1 1 2 1 2 1 2 1 2 1 2 1 2 1 1 1 1 1 1</li></ul>		-				
<ul> <li>28 Machine tools</li> <li>28 Machinery (all used in manu- facturing)</li> <li>68 Mail bag repairing</li> <li>76 Mail transportation</li> <li>20 Malt</li> <li>7 Manganese mine</li> <li>69 Manufacturing (not specified)</li> <li>69 Manufacturing (not specified)</li> <li>64 Marble, granite, slate, and other stone products</li> <li>65 V Narrow fabrics (n.s.<sup>1</sup>) other stone yard</li> <li>66 Masts, spars, oars, and rigging</li> <li>67 Matches</li> <li>69 Mats and matting (from cocoa fiber or grass)</li> <li>68 Motion picture machines</li> <li>69 Motor boats</li> <li>63 Motors</li> <li>63 Motors</li> <li>63 Motors</li> <li>64 Motorcycles</li> <li>65 Motors</li> <li>65 Motors</li> <li>66 Motor boats</li> <li>67 Motors</li> <li>68 Musical instruments and material</li> <li>68 Musical instruments (from cocoa fiber or grass)</li> <li>69 Motors</li> <li>60 Motors</li> <li>70 Matches</li> <li>71 Mets or seines</li> <li>72 Mets or seines</li> <li>73 Motors</li> <li>74 Matches</li> <li>75 Mets or seines</li> <li>75 Mets or seines</li> <li>75 Mets or seines</li> </ul>						
<ul> <li>2 8 Machinery (all used in manufacturing)</li> <li>6 8 Mail bag repairing</li> <li>7 6 Mail transportation</li> <li>2 0 Malt</li> <li>7 Manganese mine</li> <li>6 9 Manufacturing (not specified)</li> <li>6 4 Marble, granite, slate, and other stone products</li> <li>6 4 Marble or stone yard</li> <li>7 6 Masts, spars, oars, and rigging</li> <li>7 7 Matches</li> <li>9 Mats and matting (from cocoa fiber or grass)</li> <li>2 6 Motor boats</li> <li>2 6 Motor boats</li> <li>2 8 Motorcycles</li> <li>6 3 Motors</li> <li>0 7 Mucilage and paste</li> <li>6 8 Musical instruments and materials (material) (n.o.s.<sup>2</sup>)</li> <li>8 Nails</li> <li>9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>9 Neckties or neckwear</li> <li>9 Needles, pins, hooks, and eyes</li> <li>9 Mats and matting (from cocoa fiber or grass)</li> <li>3 6 Nickel</li> </ul>		-				
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<ul> <li>7 6 Mail transportation</li> <li>2 0 Malt</li> <li>2 0 Malt</li> <li>4 Manganese mine</li> <li>6 9 Manufacturing (not specified)</li> <li>6 9 Manufacturing (not specified)</li> <li>6 9 Marble, granite, slate, and other stone products</li> <li>6 4 Marble or stone yard</li> <li>7 6 Marble or stone yard</li> <li>7 6 Marble or stone yard</li> <li>8 Marble or stone yard</li> <li>9 Matches</li> <li>9 Mats and matting (from cocoa fiber or grass)</li> <li>9 Mail transportation</li> <li>9 V Mucilage and paste</li> <li>9 Mucilage and paste</li> <li>9 Musical instruments and materials (material) (n.o.s.<sup>2</sup>)</li> <li>9 Nails</li> <li>9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>9 Narrow fabrics (cotton)</li> <li>9 Neckties or neckwear</li> <li>9 Needles, pins, hooks, and eyes</li> <li>9 Mats and matting (from cocoa fiber or grass)</li> <li>9 Nickel</li> </ul>		facturing)	28	Motorcycles		
<ul> <li>20 Malt</li> <li>7 Manganese mine</li> <li>69 Manufacturing (not specified)</li> <li>04 Marble, granite, slate, and other stone products</li> <li>04 Marble or stone yard</li> <li>04 Marble or stone yard</li> <li>05 V Narrow fabrics (n.s.<sup>1</sup>)</li> <li>07 Matches</li> <li>08 Musical instruments and materials (material) (n.o.s.<sup>2</sup>)</li> <li>09 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>09 Neckties or neckwear</li> <li>09 Neckties or neckwear</li> <li>28 Nails</li> <li>59 Narrow fabrics (cotton)</li> <li>09 Neckties or neckwear</li> <li>59 Mats and matting (from cocoa fiber or grass)</li> <li>60 Musical instruments and materials (material) (n.o.s.<sup>2</sup>)</li> <li>28 Nails</li> <li>29 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>50 Narrow fabrics (cotton)</li> <li>50 Narrow fabrics (cotton)</li> <li>50 Nets or neckwear</li> <li>51 Nets or seines</li> <li>52 Nets or seines</li> <li>53 Nets or seines</li> <li>54 Newspaper</li> <li>55 Nickel</li> </ul>	68	Mail bag repairing	63			
V 7 Manganese mine 6 9 Manufacturing (not specified) 0 4 Marble, granite, slate, and other stone products 0 4 Marble or stone yard 2 6 Masts, spars, oars, and rigging 0 V Matches 5 9 Mats and matting (from cocoa fiber or grass) 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	76	Mail transportation	0 V	Mucilage and paste		
<ul> <li>6 9 Manufacturing (not specified)</li> <li>0 4 Marble, granite, slate, and other stone products</li> <li>0 4 Marble or stone yard</li> <li>0 4 Marble or stone yard</li> <li>2 8 Nails</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 V Narrow fabrics (cotton)</li> <li>0 9 Neckties or neckwear</li> <li>0 9 Neckties or neckwear</li> <li>2 8 Needles, pins, hooks, and eyes</li> <li>5 9 Mats and matting (from cocoa fiber or grass)</li> <li>2 8 Nails</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (cotton)</li> <li>6 9 Neckties or neckwear</li> <li>6 9 Needles, pins, hooks, and eyes</li> <li>5 9 Nats and matting (from cocoa fiber or grass)</li> <li>5 9 Nickel</li> </ul>		Malt	68	Musical instruments and materials		
<ul> <li>6 9 Manufacturing (not specified)</li> <li>0 4 Marble, granite, slate, and other stone products</li> <li>0 4 Marble or stone yard</li> <li>0 4 Marble or stone yard</li> <li>2 8 Nails</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 V Narrow fabrics (cotton)</li> <li>0 9 Neckties or neckwear</li> <li>0 9 Neckties or neckwear</li> <li>2 8 Needles, pins, hooks, and eyes</li> <li>5 9 Mats and matting (from cocoa fiber or grass)</li> <li>2 8 Nails</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (cotton)</li> <li>6 9 Neckties or neckwear</li> <li>6 9 Needles, pins, hooks, and eyes</li> <li>5 9 Nats and matting (from cocoa fiber or grass)</li> <li>5 9 Nickel</li> </ul>	V7	Manganese mine		(material) (n.o.s. <sup>2</sup> )		
<ul> <li>0 4 Marble, granite, slate, and other stone products</li> <li>0 4 Marble or stone yard</li> <li>0 4 Marble or stone yard</li> <li>2 6 Masts, spars, oars, and rigging</li> <li>0 7 Matches</li> <li>5 9 Mats and matting (from cocoa fiber or grass)</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (cotton)</li> <li>0 9 Neckties or neckwear</li> <li>0 9 Neckties or neckwear</li> <li>5 9 Natrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Neckties or neckwear</li> <li>5 7 Nets or seines</li> <li>5 7 Nets or seines</li> <li>5 8 Narrow fabrics (n.s.<sup>1</sup>)</li> <li>5 9 Narrow fabrics (n.s.<sup>1</sup>)<!--</td--><td>69</td><td>Manufacturing (not specified)</td><td>28</td><td></td></li></ul>	69	Manufacturing (not specified)	28			
other stone products5 VNarrow fabrics (cotton)0 4Marble or stone yard0 9Neckties or neckwear2 6Masts, spars, oars, and rigging2 8Needles, pins, hooks, and eyes0 VMatches5 7Nets or seines5 9Mats and matting (from cocoa fiber or grass)3 6Nickel	04		59	Narrow fabrics (n.s.1)		
0 4Marble or stone yard0 9Neckties or neckwear2 6Masts, spars, oars, and rigging2 8Needles, pins, hooks, and eyes0 VMatches5 7Nets or seines5 9Mats and matting (from cocoa fiber or grass)4 9Newspaper3 6Nickel						
<ul> <li>2 6 Masts, spars, oars, and rigging</li> <li>0 V Matches</li> <li>5 9 Mats and matting (from cocoa fiber or grass)</li> <li>2 8 Needles, pins, hooks, and eyes</li> <li>5 7 Nets or seines</li> <li>5 7 Nets or seines</li> <li>4 9 Newspaper</li> <li>3 6 Nickel</li> </ul>	04	-	-			
0 VMatches5 7Nets or seines5 9Mats and matting (from cocoa4 9Newspaperfiber or grass)3 6Nickel	26	_		Needles, pins, hooks, and eyes		
fiber or grass) 3 6 Nickel	o v					
fiber or grass) 36 Nickel			49			
	59					
		1				

1Not otherwise specified.

<sup>2</sup>Not otherwise specified. <sup>3</sup>Not elsewhere

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Sym-		Sym-	T. T. L
bol	Industry	bol	Industry
<b>v</b> 7	Ni tro gluconin	οv	Popoila lond
X 3	Nitroglycerin	68	Pencils, lead
69	Not specified factory	11	Pens, fountain and stylographic Pens, gold
19	Not specified food factory	32	Pens, steel
99	Not specified industry or service	0 7	Perfumery and cosmetics
29	Not specified metal factory	X 7	Petroleum refining
	Not specified textile mill		Pewter ware
59 81	Not specified transportation	36	Phonographs and graphophones
	Novelty jewelry	x 4	Phosphate (fertilizer) works
33 68	Novelty Jewelly Novelty works (material)	V 7	Phosphate mine
	Oakum	49	Photo-engraving
59 V7	Ocher mine	68	Photographic apparatus
28	Oil hurnere	οv	Photographic materials
0 V	Oil burners Oil (n.o.s. <sup>2</sup> )	43	Piano and organ materials
75	Oil pipe line	43	Pianos
xv	Oil well	1 6	Pickling and preserving fruits
X7	Oil works (n.s. <sup>1</sup> )		and vegetables
59	Oilcloth and linoleum	11	Pie, pastry, etc.
o v	Oils, essential	28	Pipe foundry
	Oleomargarine		Pipe line
19 24	Open-hearth furnace	751	Pipe mill
6 8	Optical goods	68	Pipes, tobacco
43	Organs	44	Planing mill
28	Ornamental iron factory	03	Plaster board factory
lV	Overall factory	03	Plaster mill
14	Oyster canning	ΟÝ	Plastics
vol	Oyster dredging	24	Plate mill
17	Packing house (meat or n.s.1)	32	Plated ware (knives, forks,
x 6	Paint and varnish		spoons, etc.)
V7	Paint ore mine	32	Platinum
10	Pajamas	32 46	Playing cards
ιV	Pants factory	21	Plows and cultivators
47	Paper and pulp	28	Flumbers' supplies (iron or n.s.
46	Paper bags	05	Plumbers' supplies (pottery)
48	Paper boxes	54	Plush (carpet)
46	Paper goods (n.o.s. <sup>2</sup> )		Plush (silk)
68	Paper novelties	51 28	Pocket knives
56	Paper patterns	38	Pocketbooks, purses, and card
ÓV	Patent medicines and compounds		Cases
68	Patterns (except paper)	O V	Polishing preparations
03	Paving materials (cement,	05	Porcelain ware
	stone, etc.)	76	Postal service
45	Paving materials (wood)	o v	Potash and Potassium salts
19	Peanuts, grading, roasting,	05	Pottery
	cleaning, etc.	17	Poultry killing and dressing
]		mecif	ied. <sup>3</sup> Not elsewhere classified.

<sup>1</sup>Not specified. <sup>2</sup>Not otherwise specified. <sup>3</sup>Not elsewhere classified.

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<sup>1</sup>Not specified. <sup>2</sup>Not otherwise specified.

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Syn-		Syn-	
bol	Industry	bol	Industry
14 H	Shingle mill	0 0	Charmer Citth:
26	Ship and boat building	28	Steam fittings
09	Shirts	68	Steam heating plant
	Shoddy	1	Steam packing Steam or street railroad cars
53995	Shoes (except rubber)	25	Steam or street railroad cars Steam power plant
59	Shoestring factory	28	Stean pumps
59 45 44	Shooks mill (barrel)	77	Stean railroad
44	Shooks mill (box)	28	Stean shovel factory
28	Shovels, spades, and hoes	28	Steel barrels, kegs, and drums
42	Show cases	24	Steel bars and rods
	Shutters	24	Steel plates and sheets
45 68	Signs (except electric)	24	Steel rails
V7	Silica nine	24	Steel rolling nill
51	Silk nill	24	Steel works
v 4	Silver nine	68	Stencils and brands
32	Silversmithing and silverware	68	Stereopticons and storeoscopes
19	Sirup	49	Stereotyping and electrotyping
12	Skinning station	50	Stockinet factory
45	Slat factory	87	Stockyards
04	Slate (except quarrying)	03	Stone crushing
17	Slaughtering and neat packing	05	Stoneware and earthenware
27	Sled factory	42	Store and office fixtures
10	Smocks	o v	Stove polish
00	Snuff	63	Stoves, electrical
X 9	Soap	28	Stoves, gas and oil
0 v	Soda or soda ash	28	Stoves and ranges (except
20	Soda water		electrical)
28	Soda water apparatus	66	Straw or strawboard factory
36	Solder	66	Straw or straw hat factory
o v	Solvay works	71	Street construction or maintenance
V7	Spar nine	78	Street railway
34	Spelter	28	Structural ironwork (not made in
19	Spice roasting and grinding		steel mills)
45	Spoke factory (n.s.1)	24	Structural steel
68	Sponge house	03	Stucco works
68	Sporting and athletic goods	18	Sugar factory or refinery
28	Spring bed factory	IV	Suit, coat, or cloak factory
28	Spring factory or shop	41	Suitcases (leather)
X 3	Squib factory	47	Sulphite mill
35	Stamped and enaneled ware	O V	Sulphur
X 3 35 35	Stamping works (metal)	V 7	Sulphur nine
O V I	Starch	68	Surgical appliances (Material)
46	Stationery goods (n.o.s. <sup>2</sup> )	10	Suspenders and garters
05	Statuary and earthen art goods	63	Switchboards
45	Staves	28	Table cutlery (except silver and
28	Steam and hot water heating		plated ware)
	apparatus		
-	Not enerified	2No+	othorwige grecified.

Not specified.

<sup>2</sup>Not otherwise specified.

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Sym-		Sym-	
bol	Industry	bol	Industry
42	Table factory	59	Trimmings (n.c.c. <sup>3</sup> )
28	Tacks	SV	
46	Tag factory (metal - 36)	41	Trunks
ıv	Tailor shop	83	Trust company or bank
v 7	Talcum mine	45	Tub factory
o v	Talcum mill	24	Tube mill or works
o v	Tallow	V 7	
28	Tanks (iron and steel)	67	Tungsten mine
40	Tannery		
0 V	Tanning materials		Turpentine farm
		V 7	Turquoise mine
5 V 0 V	Tape and webbing (cotton)	5 7	
	Tar	34	6T
2 V	Tar paper	ΟV	
8 V	Taxicab company	28	
63	Telegraph and telephone	68	
	apparatus	42	
79	Telegraph or telephone	10	
5824	Tents	50	Underwear (knitted)
	Terneplate	59	Upholstering materials
01	Terra-cotta factory	76	U. S. Postal Service
52	Textile dyeing	63	Vacuum cleaners
52	Textile finishing or printing	4 i	Valises and traveling bags
52 28	Textile machinery and parts	3 ₹	
68	Theatrical scenery	x 6	Varnish
5 V	Thread, cotton	28	Vault lights and ventilators
51	Thread, silk	16	
21	Threshing machinery		Velvet factory
44	Tie plant (wood)	51 45	
01	Tile or terra-cotta		Venetian blinds
Vl	Timber, log, or lumber camp		Ventilating fans
	Tin and sheet iron work	1 9	Vinegar
3536	Tin foil	27	Wagons and carriages
v7	Tin mine	47	Wall board factory
24	Tin-plate and terneplate	46	Wall paper
35	Tinware and enamelware		
00	Tobacco factory		Wall plaster Warehouse
45	Tobacco pipe factory		
0 V			Washing machines
04	Toilet preparations		Waste
	Tombstones	30	
28	Tools and cutlery		Water transportation
X 3	Torpedoes	28	
68	Toys and games	3 V 4 5	- ·
28	Tractor factory		Weather strips (wood)
gv	Transfer company	28	Welding, iron and steel
63	Transformers (electric)	30	Wharf construction
56	Trimmings (dress)	28	Wheelbarrows

3Not elsewhere classified.

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Sym- bol     Industry     Sym- bol       6 8     Whips     bol     Industry       6 8     Whisto or run     .       7 6     White lead     .       7 6     White motal     .       8     Window sach and frames (iron)     .       9     Wine mill     .       2     Wire (iros -1)     .       2     Wire (iros -1)     .       2     Wire work     .       0     Wood alcohol     .       4     5 Wood angoods (iros - s2)     .       4     5 Wood movelties     .       5     Wood scouring     .       5     Wool scouring     .       5     Wool scouring     .       5     Wool wire fenc	a and a state of the		**********	
6 g       Whips         20       Whistoy or rum         6 White lead         36       White metal         45       Willow ware         2 g       Window and door screens         2 g       Window and door screens         2 g       Window sash and frames (iron)         4 h       Window sash and frames (wood)         5 9       Window shades and fixtures         2 0       Winery         7 V       Wire (brass)         2 4       Wire mill         2 4       Wire mill         2 4       Wire screen factory         2 8       Vire screen factory         2 8       Vire work         0 7       Vood alschol         4 5       Wood carpet         0 7       Vood distillation         4 5       Wood preserving         4 5       Wood poesties         0 7       Vood poest factory         5       Wool boot factory         5       Vool poest factory         5       Vool poest factory         5       Vool scouring         5       Vool poest factory         5       Vool poest factory         5       Vool poest f	Syn-{			
<pre>2 0 Whistoy or rum X6 White lead 36 White metal 45 Villow ware 28 Windmills 44 Vindow and door screens 88 Window sash and frames (iron) 44 Vindow sash and frames (wood) 59 Window shades and fixtures 20 Winery 37 Wire (brass) 24 Wire mill 24 Wire (n.s.1) 28 Vire rope and cable 28 Wire screen factory 29 Wire work 39 Wine (n.s.1) 28 Vire work 30 Vire work 30 Vire work 31 Vire work 32 Vire work 33 Vire work 34 Vire do carpet 35 Vood alcohol 35 Vood alcohol 35 Vood notelties 36 Vire work 37 Vood preserving 38 Vood preserving 39 Vool boot factory 39 Vool boot factory 39 Vool scouring 53 Vool scouring 53 Vool scouring 53 Vool scouring 53 Vool scouring 53 Vool scouring 54 Vrampers and dresses 25 Vrought pipe 55 Virem (n.s.1) 56 Virem (n.s.1) 57 Virem (n.s.1) 59 Virem (n.s.1) 59 Virem (n.s.1) 59 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 51 Virem (n.s.1) 53 Virem (n.s.1) 53 Virem (n.s.1) 54 Virem (n.s.1) 55 Virem (n.s.1) 55 Virem (n.s.1) 56 Virem (n.s.1) 57 Virem (n.s.1) 58 Virem (n.s.1) 59 Virem (n.s.1) 59 Virem (n.s.1) 50 Virem (n.s.1) 51 Virem (n.s.1) 52 Virem (n.s.1) 53 Virem (n.s.1) 54 Virem (n.s.1) 55 Virem (n.s.1) 55 Virem (n.s.1) 56 Virem (n.s.1) 57 Virem (n.s.1) 58 Virem (n.s.1) 59 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 51 Virem (n.s.1) 52 Virem (n.s.1) 53 Virem (n.s.1) 53 Virem (n.s.1) 54 Virem (n.s.1) 55 Virem (n.s.1) 55 Virem (n.s.1) 56 Virem (n.s.1) 57 Virem (n.s.1) 58 Virem (n.s.1) 59 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 50 Virem (n.s.1) 51 Vi</pre>	bol	Industry	bol	Industry
	2x34242490V44888V5V5V559333808V9 2x34242452322220404044355521255	Whiskey or rum White lead White metal Willow ware Windmills Window and door screens Window sash and frames (iron) Window sash and frames (wood) Window shades and fixtures Winery Wire (brass) Wire mill Wire (n.s. <sup>1</sup> ) Wire rope and cable Wire screen factory Wire work Wood alcohol Wood carpet Wood distillation Wood carpet Wood distillation Wood novelties Wood preserving Wooder goods (n.o.s. <sup>2</sup> ) Wood-turning shop Wool boot factory Wool pulling Woolen or worsted mill Woven wire fencing Wrappers and dresses Wrought pipe Yarn (cotton) Yarn (n.s. <sup>1</sup> ) Yarn (woolen) Yeast Zinc factory Zinc mine		

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#### INDUSTRIES IN INDIANA - CLASSIFIED

Indiana State Board of Health Bureau of Industrial Hygiene

Symbol Industry	1930	Census	Industri	al File	Sample	For	Survey
	Plants	Emp.	Plants	Emp.	Plants	Emp.	% plt.
Extraction of Minerals V2 Coal Mines V9 Quarries	452 235 217	(24,034)* 18,279 13,711 4,568	116 91 21	9,894 8,192 1,652	58	6,990 5,558 1,381	70.6 67.8 83.6
XV Oil and Gas Wells		 (440,515)*	4	51	4	51	100.0
Manufacturing & Mech. Ind.			3,501	366 <b>,</b> 635	2,445	249,188	68•0
<u>Chemical &amp; Allied</u> <u>Ind.</u> X2 Charcoal & Coke	200	(17,704)* 7,969	208	16,182	165	13,881	85.8
X3 Explosives, Armunition	4	1,761	2	19	2	19	100.0
& Fireworks' factories X4 Fertilizer Factories		 339	7 18	128 353	7 13	128 242	100.0 68.6
X5 Gas Works X6 Paint & Varnish Ind.	35 27	1,804 876	6	975	6	975	100.2
X7 Petroleum Refineries			28 9	1,321 3,409	21 6	994 3,206	
X8 Rayon Factories X9 Soap Factories	7	76	1 4	150 1,449	1 3	150 834	100.0 57.5
Other Chemicals OVA Baking Powder OVB Blacking Stains, etc. OVC Carbon Paper, Ink OVD Chemicals, Dyes			2 4 2 40	366 461 45 2,482	2 4 2 31	366 461 45 1,952	100.0

\*Figures in parenthesis from Department of Commerce, Bureau of the Census (1932), 15th Census of the United States: 1930. Population Vol. 3, part 1, page 691. Other figures revised and obtained from U. S. Department of Commerce, Bureau of the Census, (1933), 15th Census of the United States, Manufactures: 1929. State Series, Table 12. General Statistics for the State by Industries, 1929.

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## TALLEY SHEET

#### INDUSTRIES IN INDIANA - CLASSIFIED

Symbol Industry	1930	Census	Industria	al File	Sample	For	Survey
	Plants	Emp.	Plants	Emp.	Plants	Emp.	% plt.
Other Chemicals Con.	1						
OVE Compressed Gases	9	125	8	196	7	181	92.3
OVG Drugs, Patent Medicin	ie 45	716	30	2,507	24	2,406	96.0
OVH Glue, Paste	4	13	3	94	3	. 94	100.0
OVI Greases, Tallow	24	122	4	119	4	119	100.0
OVJ Oils, not pet.			2	22	2	22	100.0
OVK Perfumes, Cosmetics	13	311	12	173	1	129	74.5
OVI Other hemicals	20	1,826	26	1,913		1,558	81.4
· ·		(2,997)				ŕ	
00 Cigar & Tobacco Fac.	40	3,351	16	1,808	11	1,365	75.5
		(22, 449)				ŕ	
Clay, Glass & Stone Ind.	286	19,872	305	21,178	216	15,955	75.3
Ol Brick, Tile and Terra-						ŕ	
Cotta			50	2,357	35	1,555	66.0
02 Glass factories	36	8,202	33	8,471	24	5,433	64.1
03 Lime, Cement and Art-							
ificial Stone	7	352	103	3,349	63	2,730	81.5
03A Cement	100	650	43	3,153	28	2,889	91.6
O3B Rock Wool			13	829	13	829	100.0
04 Marble and Stone Yards	59	4,233	29	432	23	387	89.6
05 Potteries	84	6,435	20	1,549	2	1,094	70.6
2VA Roofing & Asphalt			8	494	8	494	100.0
2VB Asbestos Products			4	524	4	524	100.0
2VC Grinding Wheels,							
Sandpaper			2	20	2	20	100.0
<b>-1</b> - 13-		(18,891)					
Clothing Industries	132	15,868	138	22,479	93	16,323	72.6
06 Corset Factories	5	503	2	485	2	485	100.0
07 Glove Factories	23	2,716	23	2,864	16	2,311	80.7
08 Hat Factories (felt)	8	292	2	145	2	145	100.0
09 Shirt, Collar & Cuff	14	2,992	17	3,603	13	2,743	
IV Suit, Coat & Overall	54	5,592	42	8,612		6,323	
10 Other Clothing	28	3,773	52	6,770	33	4,316	63.7
		(25,901)				,	
Food & Allied Ind.	1,474	25,220	884	50,861	574	33,605	66.1
11 Bakeries	469	5,556	139	4,919	87	2,962	60.2
12 Butter, Cheese & Milk	256	2,404	187	5,383		3,774	70.1
13 Candy Factories	45	1,340	19	772	14	552	71.5
15 Flour & Grain Mills	187	1,775	99	2,437	64	1,585	65.0
16 Fruit & Veg. Canning		-,		~,			
etc.	156	5,506	221	23,913	143	15,637	65.4
17 Slaughter & Packing		-,	~~-	,			
Houses	89	6,481	58	5,085	37	3,335	65.6
18 Sugar Factories &		••••	00	,		-,	
Refineries			2	408	2	408	100.0
19 Other Food Factories			13	829	10	798	96.3
19A Ice Mfg.	121	1,292	55	1,197	35	810	67.7
19B Spices, Coffee	19	111	6	185	6	185	100.0
19C Other			7	101	7	101	100.0
20 Liquor & Beverage					·		
(soft)	132	755	58	802	39	477	59.5
204 Alcoholic Beverage			20	4,830	15	2,981	61.7
	1	6	1	1			

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## INDUSTRIES IN INDIANA - CLASSIFIED

	1070	0	17		ia 7		Chart
Symbol Industry	1930 Dlantd	Census	Industri		Sample	For	Survey
Iron & Steel Machinery	Plants	Emp.	Plants	Emp.	Plants	Emp.	% plt.
Vehicle Industries	810	(161, 305)	664	147,001	447	91,258	62.0
21 Agricultural Implement		153,616 4,219	12		·±·±7 9	3,495	
22 Automobiles		•	1 i	4,214			
24 Blast Furnaces &	72	37,673	126	51,636	81	31,596	61.1
	077		017	FZ 4 170 C			50.0
Steel Rolling Mills	23	33,399	23	34,706	20	19,738	
24 A Wire Mills	18	968	18	3,197	12	1,867	
25 Car & Railroad Shops	126	23,658	22	8,300	14	6,234	
26 Ship & Boat Building	7	221	6	180	6		100.0
27 Wagon & Carriage	10	529	3	80	3	80	100.0
28 Other Iron & Steel	10			7 0 0 0			10.0
Machinery	40	3,017	107	16,816	75	10,099	
28A Aircraft			3	253	3		1.00.0
28B Foundries	332	30,494	92	11,503	59	7,042	
280 Machine Shops			34	894	26	807	
28D Small Machine Implt.	30	8,240	94	6,933	59	3,677	
28E Heavy Mach.	120	10,314	36	2,121	26	1,498	70.6
28F Other	14	884	52	4,516	- 33	3 <b>,</b> 394	75.1
29 Not Specified Metal			1				
Ind.			31	1,652	21	1,298	78.6
Metal Industries, Except		(7, 146)					
Iron and Steel	162	7,245	185	21,613	137	19,064	88.2
3V Brass Mills, Musical							
Instruments	11	1,502	44	2,965	30	2,435	82.1
31 Copper Factories	46	718	2	262	2		100.0
32 Gold & Silver Factorie	5 <b></b>		1	40	1		100.0
33 Jewelry Factories	11	226	8	358	8	1	100.0
34 Leal & Zinc Factories			8	1,131	8	1	100.0
35 Tinware, Enamelware						.,	
etc.	37	3,018	67	11,418	46	10,403	91.1
36 Other Metal Factories	38	1,461	16	3,957	11	3,082	
36A Aluminum			5	194	5		1.00.0
36B Metal Specialties			Ŭ	101	Ŭ	202	2.0000
Novelties			8	347	6	310	89.3
360 Others		<b></b>	1	10	ĺ		1.00.0
36D Electro-plating			-				200.0
Motal Fin.	19	320	25	931	19	839	90.1
		(5,261)		1 OCL		000	00012
Leather Industries	38	3,468	39	31,103	37	2,925	94.3
37 Harness & Saddle	7	162	12	276	12		100.0
38 Leather Belt, Leather							
goods, etc.	10	1,041	13	308	13		100.0
39 Shoe Factories	7	1,747	10	2,348	8	2,170	92.4
40 Tanneries	6	295	2	112	2	112	100.0
41 Trunk, Suit Case & Bag	8	223	2	59	2	59	100.0
		(30,662)					
Lumber & Furniture Ind.	704	32,107	403	24,760	271	15,863	64.1
42 Furniture Factories	199	20,709	167	16,458	115	10,442	
424 Caskets	52	778	28	1,044	20	793	
43 Piano & Organ	5	569	5	289	5	1	100.0
44 Saw & Planing Mills	179	3,803	90	1,715	57	1,094	
45 Other Woodworking	299	6,248	113	5,254	74	3,245	
20 O OTOT HOOGMOTATHE	200	<b>0</b> ,700	110	0,001	1.25	0.220	0.1.0

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## INDUSTRIES IN INDIANA - CLASSIFIED

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Symbol Industry	1930	Census	And the second second second second	ial File	Sample	For	Survey
	Plants	Emp.	Plants	Emp.	Plants	Emp.	% plt.
Paper Printing & Allied	mai	(16,822)					
Ind.	724	18,404	347	17,059	248	12,077	70.8
46 Blank Book Envelope,						7 700	
Paper Bag, etc.	21	1,007	29	2,327	22	1,502	64.5
46A Wallpaper			3	84	3	84	100.0
46B Waxpaper			3	46	3	46	100.0
47 Paper & Pulp Mills	24	2,372	12	928	10	666	71.8
48 Paper Box Factories	26	2,504	42	3,940	- 32	2,666	67.6
49 Printing, Publishing							
& Engraving	282	5,108	147	3,971	93	2,373	59.9
49A Book Binding	13	136	10	691	10	691	100.0
49B Engraving & Dev.	20	563	27	657	23	578	88.0
490 Lithographing			7	373	7	373	100.0
49D Newspaper	331	6,587	67	4,042	45	3,093	76.5
49E Stereotype	7	147					
		(10,386)					
Textile Industries	58	8,634	86	10,351	70	8,266	72.6
5V Cotton Mills	3	722	3	557	3	357	100.0
50 Knitting Mills	11	6,506	8	6,366	5	4,853	76.2
51 Silk Mills			1	75	1	75	100.0
52 Textile Dyeing, Fin-					1		
ishing Printing Mills			5	756	5	756	100.0
53 Woolen & Worsted Mills	7	697	10	967	8	952	98.4
55 Hemp, Jute & Linen							
Mills			3	123	3	123	100.0
56 Lace & Enbroidery Mill	9		1	10	1	10	100.0
58 Sail Awning & Tent	21	269	26	385	22	245	63.6
59 Other & Not Specified							
Textile Mills	16	440	29	1,112	22	695	62.5
Miscellaneous Mfg. Ind.	182	30,974	226	30,240	176	18,606	61.5
60 Broom & Brush	19	568	14	381	11	305	80.0
61 Button Factories	5	198	6	136	6	136	100.0
62A Batteries			8	1,160	6	1,140	98.2
62B Lamps	14	2,163	2	289	1	289	100.0
63 Elec. Mac. & Supply	62	24,375	69	18,911	46	9,336	49.4
64 Independent Hand Trade	s		3	30	3	30	100.0
65 Rubber Factories	11	1,463	27	5,003	21	3,450	68.9
66 Straw Factories			1	253	1	253	100.0
68 Other Miscellaneous	5	51	33	968	25	703	72.6
68A Signs	25	425	17	378	14	343	90.7
68D Toys & Novelties	13	850	7	333	7	333	100.0
68E Hair Goods, Artificia	11.						1
Flowers			4	268	4	268	100.0
68F Mirrors Lenses	11	453	19	608	14	498	81.9
686 Lamp & Window Shades	12	175	8	164	8	164	100.0
68H Other Not Specified	6	255	4	80	4	80	100.0
71 Bridge & Bridge Constr			4	1,278	4	1,278	100.0

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INDUSTRIES IN INDIANA - CLASSIFIED

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Symbol Industry	1930	Census	Industria	al File	Sample	For	Survey
	Plants	Emp.	Flants	Emp.	Plants	Emp.	1% plt.
		(9,748)					
Personal Service			195	5,879	132	3,989	67.8
97 Laundries			121	4,372	83	3,019	69.0
98 Cleaning, Dyeing and							
Pressing Shops			74	1,507	49	970	64.4
		(440, 515)					
Mfg. & Mech.			3,501	366,635	2,445	249,188	68.0
		(24,034)					
Extraction Minerals	452	18,279	116	9,894	78	6,990	70.6
		(9,748)					
Personal Services			195	5,879	132	3,989	67.8
GRAND TOTAL			3,812	382,408	2,655	260,167	68.0
		(474, 297)	·	-		•	

## PLANTS IN INDIANA BY COUNTIES

	NO.*	NO.*	NO.		NO.	
COUNEY	PLANTS CENSUS	EMPLOYED CENSUS	PLANTS OBTAINED		EMELOYEE'S	
			Total	Sample	Total	Sample
Adams	33	1,280	33	21	2,153	1,696
Allen	1.64	15,015	, 240	164	24,995	12,007
Bartholomew	52	2,684	65	39	4,014	3,064
Benton	7	106	4	2	99	24
Blackford	23	1,418	23	18	1,513	1,424
Boone	20	358	17	13	852	369
Brown	2	5				
Carroll	14	79	13	8	224	172
Cass	38	1,457	53	35	2,779	2,438
Clark	26	1,309	24	17	1,864	1,017
Clay	23	408	40	30	1,275	993
Clinton	23	1,160	17	13	1,107	832
Crawford	8	66	8	6	252	212
Davies	24	842	17	10	863	736
Dearborn	38	2,199	26	20	3,502	2,068
Decatur	17	284	17	11	484	331
DeKalb	24	842	28	19	1,279	937
Delaware	106	9,040	114	78	13,076	8,870
Dubois	63	1,651	63	42	2,619	1,798
Elkhart	140	6,425	155	112	9,555	8,000
Fayette	24	3,126	24	18	4,516	1,865
Floyd	51	2,477	36	24	2,809	1,623
Fountain	17	522	18	16	862	705
Franklin	2	5	7	1	155	5
Fulton	16	199	8	5	302	173
				U	005	

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	NO•*	NO.*	NO.		NO.	
	PLANTS	EMPLOYED	PLANTS		EMPLOYEE	S
COUMTY	CENSUS	CENSUS	OBTAINED		OBTAINED	
	1		Total	Sample	Total	Sample
Gibson	23	782	22	10	1,257	846
Grant	81	5,906	77	51	8,024	4,728
Greene	20	425	23	17	1,123	802
Hamilton	22	555	23		1,206	694
Hancock	1.9	257	13	9	898	510
Harrison	14	446	7	5	451	369
Hendricks	7	53	1	1	±01 7	7
		1	41			
Henry	45	4,226	-	32	6,701	5,877
Howard	48	4,672	67	44	10,262	7,007
Huntington	44	1,747	32	17	1,943	1,087
Jackson	43	2,238	39	30	2,597	1,898
Jasper	8	23				
Jav	21	2,148	26	18	3,644	2,519
Jefferson	23	337	20	12	742	41.7
Jennings	13	316	7	6	255	245
Johnson	31	1,569	24	15	3,864	2,790
Knox	36	1,375	49	34	3,477	2,802
Kosciusko	33	712	33	12	1,381	1,100
LaGrange	5	95	9	5	140	71
Lake	221	47,884	214	156	66,186	45,065
LaPorte	90	5,446	87	65	8,926	7,336
Lawrence	28	1,394	32	21	2,320	2,076
Madison	119	14,324	166	11-1	20,204	10,593
Marion	736	36,828	454	325	-19,523	39,350
Marshall Martin	275	499	27	18	1,263 158	681 158
Miami	30	1,082	30	23	2,043	1,459
Monroe	41	1,843	55	35	3,063	1,378
Montgomery	31	1,119	44	28	1,856	1,016
Morgan	34	406	19	13	584	401
Newton	9	37	1		20	
Noble	32	846	28	21.	1,532	1,014
Ohio	2	5	1	1	25	25
Orange	14	338	9	6	337	223
Owen	7	179	11	8	262	228
Parke	9	3-1	7	4	.185	85
Perry	28	1,389	21	16	1,757	1,340
Pike	9	34	2	2	120	120
Porter	26	592	15	15	840	840
Posey	17	650	12	8	631	563
Pulaski	9	76	3	2	110	105
Putnam	10	415	9	8	494	471
Randolph	28	1,510	32	23	2,605	2,000
Ripley	26	823	15	10	1,321	819
Rush	22	482	19	11	1,540	1,008
					,	,

# PLANTS IN INDIANA BY COUNTIES

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PLANTS IN INDIANA BY COUNTIES

	NO.*	NO.*	NO.		NO.	
	PLANTS	EMPLOYED	PLANTS		EMPLOYER	IS
	CENSUS	CENSUS	OBTAINEI	)	OBTAINEI	)
<ul> <li>In programming an example of the final set of the second se</li></ul>			Total	Sample	Total	Sampl.e
Scott	7	1,514	2	4	1,450	1,590
Shelby	38	1,572	35	22	2,796	1,811
Spencer	15	94	11	8	493	280
Starke	6	166	3	2	66	56
Steuben	17	115	8	7	106	99
St. Joseph	179	20,873	203	141	24,434	16,293
Sullivan	11	105	17	11	1,389	203
Switzerland	4	16	1	1	7	7
Tippecanoe	57	2,068	36	25	4,951	3,924
Tipton	26	704	21	13	1,396	931
Union	5	41	2	2	72	72
Vanderburgh	181	13,221	240	175	20,686	12,496
Vermillion	14	366	23	15	1,771	1,317
Vigo	108	5,853	142	99	9,715	6,188
Wabash	41	1,168	40	30	2,563	1,700
Warren	1	5				
Warrick	14	195	14	11	525	382
Washington	19	408	14	1.0	928	821
Wayne	88	4,616	85	57	7,469	6,094
Wells	14	156	12	8	341	264
White	13	6].8	7	1	767	630
Whitley	15	879	12	9	1,054	335
TOTAL	3,964	254,113	3,813	2,642	380,010	259,573

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\*Biennial Census: 1935 Bureau Census

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## C O P Y

## STATE OF COLORADO DIVISION OF PUBLIC HEALTH

State Office Building, Denver

The State Board of Health is conducting a survey of industries in Colorado. The objective of the present study is to obtain general information concerning conditions of environment associated with the various occupations which potentially may have an effect on the health of the workers. Such facts are needed to appraise the occupational disease problem. It is hoped that this study will yield valuable data for the constructive development of a permanent industrial health service in Colorado. This information will be used only for the purpose stated and will be treated in such a confidential manner that no individual plant findings will be revealed.

Time does not permit the study of each and every plant; hence we have selected a random sample of the various industries to be studied and your establishment was selected without consideration of whether we might find the occupational environment poor, average or good.

A properly identified representative of the State Board of Health will call on you within the next week or ten days to obtain the desired information. It will be very helpful if you could assign someone for the purpose of giving him the data needed and to accompany him throughout the plant.

Your kind cooperation will be greatly appreciated.

Very truly yours,

R. L. CLEERE, M.D.

Secretary and Executive Officer Colorado State Board of Health

RLC:hm

B-2637

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## COLORADO

STATE BOARD OF HEALTH

State-wide Industrial Hygiene Survey

FIELD SURVEYORS MANUAL

R. L. Cleore, M.D., C.P.H.

Secretary and Executive Officer

May 1938

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## STATE-WIDE INDUSTRIAL HYGIENE SURVEY

The State-wide Industrial Hygiene Survey in Colorado is being conducted by the State Board of Health. The objectives of this survey of industrial establishments are fourfold:

- 1. It will furnish an opportunity to become thoroughly acquainted with industries in Colorado.
- 2. It will enable us to evaluate the potential health hazards associated with a wide variety of occupations which will yield information needed in laying a basis for the constructive development of industrial hygiene.
- 3. It will enable the State Board of Health to better assist industry in solving and controlling their industrial health problems.
- 4. It will provide a valuable source of information for State departments, for medical interests, or any other agencies interested in industrial hygiene.

To achieve the objectives of this study, Forms 3, 3-A, and 4 have been evolved for recording the data necessary to obtain a comprehensive conception of the problem as it exists in a given locality.

The success of this study depends upon the accuracy and thoroughness with which you fill out these forms. The reverse sides of these forms may be used to supplement or describe more thoroughly, the processes viewed or other conditions. It would be well to briefly describe the production operations, in sequence, from the raw material stage to the finished product for each plant surveyed.

Bear in mind that this information cannot be interpreted as indicating in any manner whatsoever that an exposure to an industrial condition or material necessarily implies injury to a workman, BUT MERELY INDICATES THE POTENTIALITIES OF THE SITUATION.

We are not detecting industrial health hazards. Health hazards can only be ascertained by <u>medical</u>, <u>engineering</u> and <u>chemical determinations</u> interpreted by a trained industrial hygienist. We are not inspecting plants but are engaged in a survey to gather information concerning the conditions of environment associated with the various occupations in Colorado industries. To this end, we are seeking the cooperations of industries. Therefore, it would be wise to omit the words "inspection" and "hazards" in any discussion that you may have with plant officials or others.

Page 2. State-Wide Industrial Hygiene Survey, cont.

<u>Refrain from giving personal opinions on industrial hygiene</u> conditions, as such opinions, if inaccurate, will impair the reputation of the State Board of Health and reflect upon your work. Simply inform interrogators that opinions can only be given after exact determinations and not by the type of study we are conducting.

A correct attitude of each field worker toward the survey and the various individuals with whom he may come in contact is very important. As repeated above, the survey is for the collection of specific data and the surveyor is not in position to form and express opinions as to the importance of exposure found nor the probable effects upon workers. An investigator must maintain an open and unbiased mind. It is important to obtain full information concerning favorable as well as unfavorable conditions. Also, his attitude toward plant officials must be such as to encourage cooperation and never imply criticism. In approaching officials of a particular plant, the workers should assume that cooperation in the study has already been cleared by letters from the central office and that he will encounter no objections. If there should be objections, he should try to explain as diplomatically as possible the reasons for the survey and that the data will be considered in a general way only. Also he should point out that only the environmental conditions and potentialities and not the extent or magnitude of actual hazards are to be determined. He should remember that the cooperation of a particular plant official is entirely voluntary, and there is no cause for irritation if in an extreme case the surveyor should be refused entry to the plant or the information requested. In such a case he should courteously leave the plant until further negotiations can be made.

It is only natural that some plant officials may inquire the purpose of the survey and of the general industrial hygiene program. General information is included in this manual and each worker is encouraged to inform himself in order that he may give intelligent replies to such questions and obtain the confidence of plant officials. However, he should not attempt to be too specific, but for details should refer the inquirer to the office of the State Board of Health.

A diplomatic method of approach and of making the first contact with the designated plant official or someone authorized by him to give the information are unfailing rules. The success of each worker will depend upon his methods of approach. No entry or inspection of a plant should be made until the proper official is contacted, even though it is necessary to wait some time or perhaps leave and return at a later hour. Moreover, discussion of the purpose of the visit with other workers with whom he may have casual contact while waiting, may lead to trouble and should be avoided.

## Page 3.

State-Wide Industrial Hygiene Survey, cont.

In some cases workers may be approached by individual acquaintances or perhaps by newspaper representatives who will request information or statements relative to the survey and the industrial hygiene program. Too much talk can lead to serious misunderstandings and criticism of the activity of the State Board of Health. In no case should interviews with newspaper reporters or any statements to be published in the papers be given. For example, each worker should avoid the following:

- 1. Any statement which involwes the policy of the State Board of Health.
- 2. Any statement, general or specific, relative to conditions found or thought to exist in various industrial plants of the vicinity, or of the State.
- 3. Criticisms or discussion of individuals with whom the worker has come in contact in the course of his work.
- 4. Discussions or contacts with laborers or their representatives concerning plant conditions or findings. It is, of course, permissible to outline the general objectives of the survey to such persons in the same manner as to industrial officials, but this should be done only upon inquiry.

The above are merely examples which indicate the possibilities of getting into trouble by talking too freely. A diplomatic person can ward off the most specific question without giving out information which it is desirable to withhold and without offending the questioner.

Do not allow yourself to get away from the proposition that this is a fact finding inquiry relating to the aggregate industrial health in establishments of similar kinds and that INDIVIDUAL PLANTS will not be montioned in the report as such.

## SPECIFIC INSTRUCTIONS FOR MAKING ENTRIES ON PLANT SURVEY FORMS

To facilitate filling out the plant survey forms, the following definitions for the various headings in these forms are given below:

## FORM NO. 3 -- INDUSTRIAL HEALTH SERVICES

The industrial health service form, a sample copy of which is included in this manual, is for the purpose of identifying the plant, recording safety and medical provisions which are afforded, and determining the presence of records. It is taken for granted that the entire number of employees is subject to these provisions, and, if not, this should be clearly explained in the remarks. For this reason, only one of these forms is required for each plant.

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. 5 ш	COLORADO INDUSTRIAL Industrial Health	. HYGIENE SURVEY 1 Service data		Page of Surveyed by	
Name of Plant		Industry Code and No.	No •		
County	Cit <sub>v</sub>	Location			
Plant Owner	Åddress	e S S S		NO	
Plant Official	1110		•	Ed Fay E	
Froduct Manufactured or Service					
SAFETY PROVISIONS	MEDICAL PR	PROVISIONS	~.	BENEFITS AND RECORDS	CEDS
Safety Full time Director: Fart time None	Hospital: Company Contract None	Physician: Full time Fart time On call None		Sick Benefit Y Organization: N	Yes
Supp Yes Committee:No	First Aid Yes Room: No	Nurse: Full tine Part time None		Sickness Records: Waiting period	Yes
Insurance Yes Service: No	First Aid Yes Kit: No	Р,Н. R.N. Other		Àccident Records:	Yes. No
Other: Yes No	Trained First Yes Aid Torker: No			Seasonal: Operating perioù:	
Remarks:	Remarks:			Remarks:	
Check in blank which applies	Colorado State Board of Hea	<u>Health, Division of Industrial</u>	strial Hygiene.	le.	

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Page 4.

State-Wide Industrial Hygiene Survey, cont,

The form is designed with five lines at the top where information should be written in, and three blocks of information; namely, "Safety Provisions," "Medical Provisions," and "Benefits and Records." In these three blocks the information is recorded by placing a check mark in the blank which applies under each sub-heading. Remarks which apply to a particular item should be properly identified. Please write plainly (all printing or writing should be legible). The various items on the Industrial Health Service data form will be explained briefly as follows:

Page -- Form No. 3 will always be page 1 of the total number of sheets used.

Surveyed by -- Record your signature.

Name of Plant -- Full name of plant.

Industry Code and Number -- Leave this space blank.

<u>Date</u> -- The date when this form was completed and recorded. Enter date in a uniform manner using the number of the month first, followed by the day and year; for example, 4/20/38 for April 20, 1938.

County -- Self-explanatory.

<u>City</u> -- This refers to the incorporated town or city within the limits of which a plant is located, or give the post-office address.

Location -- The purpose of this blank is to enable another worker to find the plant again easily, and also to determine whether it is inside or outside the town given as the address. If within the limits of the town, give the address; e.g., "192 Main Street." If the location is difficult to find, explain the location; e.g., "Northwest side of town," "Near Lake Street Bridge," etc. If a plant is outside the town, its location should be referred to landmarks which are easily identified; e.g., "12 mile east of Highway 67 and 2 miles north of town."

Owner of Plant and Address -- Give the name and address of the individual, firm, or corporation owning the plant regardless of whether the address is nearby or in another state.

<u>Plant Official</u> -- Refers to the person in charge of the plant who may be found there most of the time and who would regularly receive mail addressed to him at the plant.

Title -- Self-explanatory.

Products Manufactured or Service -- On the Industrial Health Service data sheet state briefly the articles made by the firm at this plant; e.g., "gray iron castings for pumps, car wheels," <u>placing them in order</u> of importance to manufacturer. If the company is a service industry, name the type of service, as "laundry."

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Page 5.

State-Wide Industrial Hygiene Survey, cont.

<u>Number of Employees -- Male, Female and Total</u> -- To be entered after completion of survey at plant from totals on Forms 4. Show the total number of employees as determined from the workroom survey forms, with the number of males and females comprising this group.

<u>Full Time</u> -- By "full-time" is meant that a person spends more than one-half of his work day every day in the specified activity while the plant is in operation. This applies to safety director, physician and nurse, below.

<u>Safety Director</u> -- A person of special training or ability acquired from experience, who is employed or designated from the plant personnel, to study and improve conditions for the prevention of accidents.

<u>Shop Committee</u> -- Committees made up of employees from the various departments or from the plant at large designated to have certain responsibilities for accident prevention.

<u>Insurance Service</u> -- Applies to the use of safety service rendered by an insurance company: such as posters, periodic inspections, etc.

Other -- Any other special provisions or arrangements designed to prevent accidents, such as membership in National Safety Council.

### Medical Provisions

<u>Hospital</u> -- May be company owned, located at, or convenient to the plant. A hospital is defined as a place located on the company grounds where the pationt may be kept overnight or for duration of illness with adequate medical attention. "Contract" is a definite agreement between the plant and a hospital for care of its employees. If neither is available, none should be checked.

First Aid Room -- A room set aside and equipped for this and no other purpose.

First Aid Kit -- An adequate first aid kit should contain all items nocessary in rendering first aid in cases of accident or sudden ill-ness.

<u>Trained First Aid Worker</u> -- May or may not refer to a full-time worker depending upon the size of the plant, but does mean a certified first aid worker who is always present in the plant and available to render this service while the plant is in operation.

<u>Physician</u> -- Refers to a full-time or part-time physician employed or retained by the company officials to render medical service in case of accident or illness of employees, conduct physical examinations and carry out other medical service. "On call," a definite contract between the company and a physician, who comes to the plant when called. •

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Page 6.

State-Wide Industrial Hygiene Survey, cont.

Nurse -- To render nursing service on a full-time or part-time basis.

"P.H." refers to a public health nurse -- a registered nurse with public health training.

"R.N." refers to a registered nurse.

<u>Remarks</u> -- Apply to any of the three blocks of information: namely, safety provisions, medical provisions, or benefits and records, and should be placed in the respective blanks, if possible, but in all cases refer remarks

to proper items by use of similar symbols.

### Benefits and Records

<u>Sick Benefit Organization</u> -- A fund or insurance maintained by either employers or employees, or both, to provide payments to employees during periods of disability from sickness or non-industrial accidents. If carried by an insurance company, state under remarks where records are kept.

<u>Sickness Records</u> -- State whether the company maintains such records for each case of disability through sickness, and how long a period of absence or waiting period must elapse before sickness records are made.

Accident Record -- State if records for lost time due to accidents are kept.

<u>Seasonal</u> -- Fill this space only if plant is seasonal, and enter approximate dates of operations.

Form 3-A	COLORADO INDUSTRIAL HYGIENE Industrial Health Service Data	E SURVEY (continued)	Page of of surveyed by
Name of Plant		Code and No.	•
	City		
	VENEREAL DISEASE INFORMATION	A T I ON	
Serological Tests (Tasserman, etc.) on	: Yes	Remarks:	
Positive Cases (Non-infectious) accepted	Ves No		
Serological Tests on employees: Yes	Annually 6 months		
Disposition: 2. Treated at plant			
е тен	1		
l u lgnored l you be willing to cooperate wormed biscoss succession	1 the State Board of Health		
Immunization Program against Contagious I	Diseases at	Remarks:	
	Yes No		
	SAMITARY FACILI II	ES	
Water Supply Drinking Mash	ashing Toilet Sewerage System	n.   Remarks:	
c đno Ţ			
Municipal Well Stream Chlorinat Stream Chlorinat Fountain Conmon cuj Other Other Conmon cuj Conmon cuj Conmon cuj Conmon cuj	Γουπιου τον Οτηοι τονο Είτουνοια Είτουνοια Γιοτομο Γιακο Για Για Για Γιακο Για Για Για Για Για Για Για Για Για Για	forni •čožo Svoi •bri Vani •čoš Vanoř	
Check in blank which applies	Colorado State Board	of Health, Division of Ind	Industrial Hygiene.

#### Page 7

# FORM NO. 3-A -- INDUSTRIAL HEALTH SERVICES (continued)

This form is a continuation of Form 3 and it is necessary to fill out one form for a plant.

Heading: Definition of entries some as on Form 3 except Form 3-A will always be page 2 of total number of pages. VENEREAL DISEASE INFORMATION

Place a check mark (V) in blank which applies.

Scrological Tests (Wasserman, etc.) on applicant: Show whether a serological test is required or taken on each applicant for a position. If only for certain positions, state for which positions under remarks.

Positive Cases (Non-infectious cases) accepted: Do not fill in if test is not required on applicant for a position.

<u>Serological Test on employees</u>: Check if done at any time. If done at any other time than annually or semi-annually, check other and explain under remarks.

Disposition: Self-explanatory. Applies to employees only.

Would you be willing to cooperate with the State Board of Health in a Venereal Disease prevention program?

This specifies:

- 1. The examination of blood for syphilis as part of a routine physical examination at time of application for employment.
- 2. A periodic examination of employees for venereal diseases.
- 3. Provision for adequate treatment and follow-up either by private physician, clinic or company doctor.
- 4. An educational program as regards venereal diseases.

<u>Immunization Program</u>: Inquiry should be made concerning provisions made for immunization against smallpox, typhoid fever, Rocky Mountain spotted fever, or any other disease.

#### SANITARY FACILITIES

Place check mark in each column if facility is provided using plus sign  $(\neq)$  to note presence of facility and minus sign (-) to denote absence. Whenever "other" is checked plus  $(\neq)$ , it may be necessary to explain under remarks.

Under Water Supply and Sewerage system, if only the municipal supply or system is used, the other entries under the headings will be checked with a minus sign. It is only necessary to show treatment of water supply or place of discharge of sewerage when a private water supply and sewerage treatment plant are used. P

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Page of	Industry Code and No.		Date	A contract of the second state of the second s	Division of Industrial Hvziene
COLORADO INDUSTRIAL HYGIENE SURVEY WORK ROOM SURVEY DATA	Location Location	Work Room	sd by	General Ventilation Positive Negative Raw Materials and By-Froducts	State Board of Health
COLORADO INDU WORK RC			Surveyed	Mature of Job	
				Number of Persons M F T	
Form 4	Name of Plant	Department	Informants Name	Occupation	Total

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Page 8.

Fountain -- Any type of bubble fountain. If, however, an approved type is noted, place "A" in column instead of the usual check mark.

Individual cup. Self-explanatory.

Common cup. Self-explanatory. Lavatory -- Check if adequately equipped lavatories are furnished which are used for washing facilities only and not used for any industrial process.

<u>Other</u> -- Washing facilities provided but not adequate, or not confined entirely to washing (hands).

<u>Common towel</u> -- Signifies common towel or towel used by more than one person.

Other towel -- Individual towels, paper or cloth provided for single service.

Showers -- Showers provided.

Toilet Facilities -- Indicate type installed and at top of the column note number.

Flush -- Flush toilet.

Pit Privy -- Indicate by "A" if approved type of pit privy: otherwise enter plus(/) if unapproved type. Other -- Any other type provided.

Sep. lunch room -- A lunch room entirely separated from work rooms and lockers.

Ind. locker -- Individual lockers.

FORM NO. 4 -- WORK ROOM DATA

Page\_\_\_\_\_\_of\_\_\_\_\_. Note page number of total number of pages.

<u>Name of Plant</u> - A similar record should be made for this item as indicated on Form 3.

Location -- Give the address of the plant at which the survey is made, e.g., 1500 Sherman Street, Denver, Colorado.

Industrial Code and Number -- Leave blank.

<u>Department</u> -- Record the name of the department as "pasting," "mixing," etc. Make a separate sheet for each department in a workroom unless there are only one or two occupations in the department. <u>Where two or more departments are located in one workroom, show location by sketch on back of sheet.</u>

Workroom -- A workroom is defined as a room entirely enclosed. If a deportment occupies two or more workrooms, separate sheets should be used for each workroom. Workrooms in a plant should be numbered consecutively for plant as 1, 2, 3, etc.

Page 9.

Informant's Name -- Record name of person supplying information, given names may be initialed, as J. A. Smith, but never be less specific. List on first workroom form only if informant is the same in all workrooms.

Surveyed by -- Use your initials or name on workroom forms.

Date --- Record date each workroom is surveyed.

## OCCUPATIONAL INFORMATION

Occupation -- List the names of the occupations, using as many sheets as necessary. If a specific occupation is known by more than one name, list these names directly under the one most commonly used, and bracket the synonymous names. If impossible to keep sequence of occupational processes in order, show flow diagram on back of sheet.

<u>Number of Persons</u> -- Record, by sex and total, the average monthly number of omployees engaging in the occupation designated. Do not classify any worker under more than one occupation. There is space for recording five occupations and related information. When the number of employees in a department or workroom has been enumerated on these records enter the total in the proper place, at the bottom of columns 2, 3, and 4. Record only workers engaged in occupations within the plant proper. Exclude salesnen, etc., but include all others occasionally exposed to the workroom environment, such as supervisors, chemists, truck drivers, etc. Group all of the occupatiens in the office force together. Do not be afraid to use more than one space for one occupation if necessary.

<u>Mature of Job</u> -- Record briefly, but with sufficient clarity, duties associated with the occupation (example: occupation -- weighers, nature of job -- weighs asbestos and cotton materials on hand scale).

Raw Materials and By-Products -- List all the materials associated with the occupation. When possible, give both trade name and manufacturer of each raw material. In instances where the plant officials are unaware of the exact compounds in certain materials, be satisfied with noting the trade name of the material or the number assigned to a specific material by certain manufacturers. Do not use chemical symbols alone. Do not use ditto marks. Do not include tools which are not subject to disintegration during process. Quite often certain by-products in an occupation or process are evolved which in themselves are potentially hazardous in nature. For example, in the making of paper pulp from wood by certain chemical processes, sulphur dioxide gas, hydrogen sulphide gas and organic sulphuretted compounds are evolved as by-products. Record all such data. Oftentimes there may be an exposure to a material from another department or process; in such cases, this material should be included with an asterisk, and a footnote "contributory source."

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## Page 10.

<u>General Ventilation</u> -- This applies to ventilation provisions common to the entire workroon. Place a small "/" or "-" sign in each of the two small squares under this heading to signify whether or not these two methods of general ventilation are in existence. These squares are located above the column heading marked "raw materials and by-products."

- A. Positive ventilation refers to supply type in which air is <u>forced</u> into the room. At least part of this air must be fresh air from an outside source.
- B. Negative: Negative ventilation refers to exhaust methods of removing air from a room.

<u>Control Measures</u> -- This column is to be filled out for all occupations in which there is an exposure to dust, fumes, vapors, mists, gases, or other conditions requiring control and types of control measures should be indicated (plus sign for "yes" and minus sign for "no"). Each and every small square must be filled in with either a "/" or "-" sign which will signify whether or not that particular control measure is in use. <u>Indicate for which materials or by-products the control is used</u>. The control measures shown on the record refer specifically to the occupation in question. Space and time will not permit complete records of all control measures used or needed. The ones provided usually will be sufficient; however, other important observations may be recorded under "remarks," on the reverse side of the sheet.

- A. Local Exhaust: This type of ventilation refers to provisions for ventilating a particular section of the workroom, for example, an exhaust system attached to tool grinders, etc., and should not be confused with general exhaust which serves the entire workroom. One room may be equipped with a general and several local exhaust systems.
- B. Enclosure: This refers to control measures consisting of process in a total enclosure; for example, sandblasting cabinets which are relatively small box-like enclosures in which the process is controlled through openings that admit tools or hands of the operators into the cabinet. The objective is to protect the operators and other workers in the environment against the hazards of the process.
- C. Wet Methods: Refers to the use of water or other liquids as in rock drilling or hydraulic knockouts, for the purpose of allaying dusts, created in certain processes. If a wet process has been substituted for a dry process, note this fact.
- D. Personal Respiratory Protection: Record whether gas masks, respirators or air line respirators are used. In the case gas masks and respirators are in use, note whether they are types approved by the U. S. Bureau of Mines. If approved, the official government seal and name of the Bureau will be stamped on the equipment.

#### Page 11.

- E. Protective Clothings: Note use of goggles, aprons, gloves, rubber boots, etc.
- F. Others: Refers to any type of control measures not listed on the form, i.e., skin protecting agents such as vaseline, "Protecto," "Nu-skin," talc, etc. Any pertinent observations concorning such measures may be recorded under "remarks."

In the rectangular space directly below the small squares, indicate for which materials or by-products the control is used and what constitutes the "other" control measures when used. It may be necessary to use the reverse side of the sheet.

Material Code -- Leave blank.

### GENERAL COMMENTS

1. Describe the nature of each occupation as briefly as possible but describe it completely. Keep sequence of operation. In going through the plant originally it may not be possible to do this, but when copying forms, place departments and occupations in order of operation.

2. List all raw materials, by-products, and materials from contributory sources.

3. List all methods of control but do not attempt to judge their efficiency.

4. Please submit <u>two copies</u> of each survey to the central office. You will find it necessary <u>to copy</u> the data collected in the plant and a carbon copy can be made at this time.

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COLORAIO INDUSTRIAL HYGIENE SURVEY Material Exposure, by Occupation, in Each Industry Page Page	Industry Code Name of Industry	Number of Persons Exposed, Classified by Plants	Plant Number	Population	Occupation													Total	<i>₽</i> %	<sup>c</sup> Population brought forward Colorado State Board of Health, Division of Industrial Hygiene
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Form 7

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COLORADO INDUSTRIAL HYGIENE SURVEY

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Form 8

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Form 9-	1	Material Industry			Plant Nc.										

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Form 9A

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#### CONTROL MEASURES BY MATERIAL EXPOSURE TABULATION SHEET

# Industry Codes

# Name of Industry

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EDITCR & OFFICE SUPERVISOR STATE DIVISION OF LABOR Mrs. Wilson Dr. Louis 7. Spolyar Miss Reams Thomas R. Hutson 14 STENO-TABULATORS Mrs. Richter Miss Cook BUREAU OF INDUSTRIAL HYGIENE Dr. Louis W. Spolyar STATE BOARD OF HEALTH Dr. Verne K. Harvey F. C. Black J. S. Fleming H. E. Miller J. F. Keppler C. A. Roichelderfer ENGINEERS FIELD SUPERVISOR John S. Wiley 10 FIELD C. V. Tard H. E. Schellhase Ben Karnisky M. J. Timm Division of Industrial Hy-A. E. Hollenbeck U.S.F.H.S.U giene

ORGANIZATION OF INDIANA INDUSTRIAL HYGIENE SURVEY



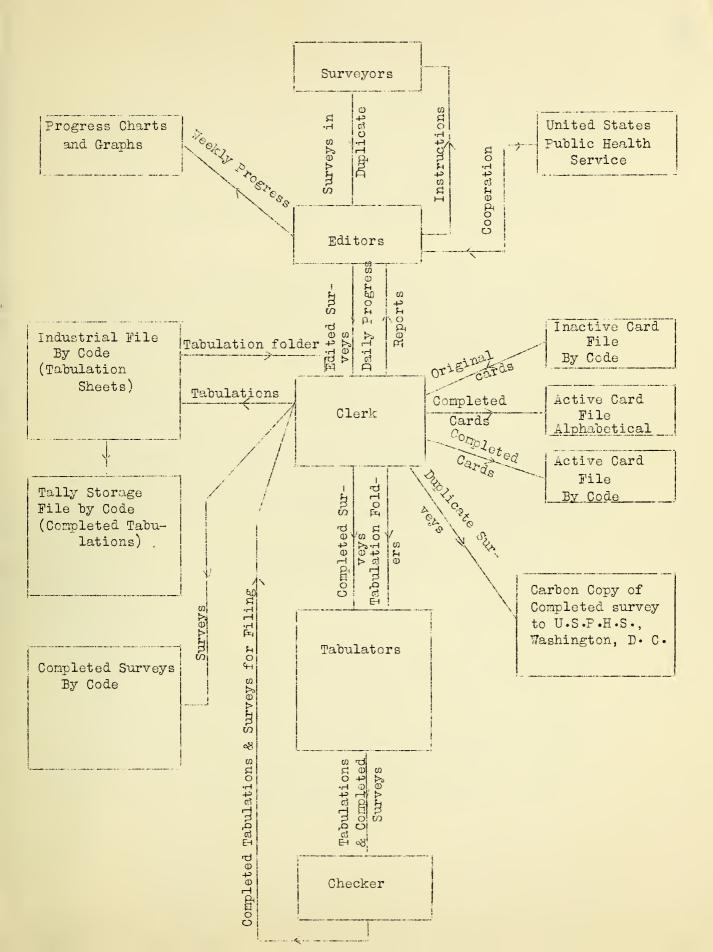
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#### FLOW SHEET FOR INDUSTRIAL HYGIENE SURVEY Indiana State Board of Health



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#### SEQUENCE OF OPERATIONS IN SURVEY OFFICE

After the control cards have been selected for the companies to be surveyed, all pertinent data are placed on these cards. Centrol cards should be given to a stenographer about two weeks before the plant survey is scheduled so that she can send out introductory letters. A 3-copy list of all companies receiving letters should be prepared by the stenographer (Form A). Two copies of this list should be given to the field supervisor, who in turn assigns each plant to a surveyor and notes this assignment in the columns marked "Engineer (Surveyor)" and "Date survey assigned".

As the surveys are brought into the office by the surveyors, or nailed in, they are placed in the file box on the field supervisor's desk. The field supervisor checks off the survey returned on the original list. These lists are kept in order by surveyor's name. The field supervisor records the number of surveys returned daily, the total number returned by surveyors weekly, number assigned, surveyed, refused, etc. (Forms B, C & D).

Determine if industries have a seasonal operating period and see that they are surveyed in season.

The field supervisor checks over surveys for consistency, cmissions, etc., and then places them in the file box on the editor's desk. The editor edits and codes each survey, and as he codes a plant in an industrial classification, he places a tally mark beside that classification on the tally sheet.

> The material exposure in red (List E) Control in blue (List F)

The editor places the edited surveys in a file box, marked "edited surveys".

FIRST TABULATOR: The first tabulator takes these surveys, prints the code number on each sheet, copies editing and any additions made to the original sheet on the duplicate, and checks total number of employees on Form 3 by adding numbers from forms 4 on adding machine, and attaches the tape to the survey. Then he separates original forms from duplicates and places original surveys in file box on stenographer's desk and files duplicate copy in order of code number. He may also assist third tabulator with Forms 7 and 9. As seon as originals and duplicates are separated, each complete survey and copy should be stapled.

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STENOGRAPHER: The stenographer places control cards of companies which have had letters sent to then in alphabetical order in file box on her desk. When edited surveys are placed on her desk by first tabulator, she attaches control card to survey form. She checks data on card for:

- A. Product manufactured or service
- B. Name and address of plant
- C. Name of surveyor
- D. Enters date for date coded or edited
- E. Enters population figure for males, females and total

The stenographer adds code number to this card, and makes up a duplicate card showing:

Product manufactured	Code number
Name of plant	Population figures
Address	Plant official or owner
Surveyor assigned	If no sickness record then note
Dates	Also waiting periods
	Note when kept by insurance company

These cards are filed inmediately in file headed "SURVEYS COMPLETED--ALPHABETICAL". The surveys are placed in file box No. 2 on her desk.

The stenographer keeps a daily record of progress:

- A. Letters sent out
- B. Number of surveys returned (this information from field supervisor)
- C. Number of surveys for which duplicate card was made (number edited)
- D. Number of surveys tabulated (finished control cards returned by third tabulator)
- E. Number of plants refused, out of business, too small.

She files control card in file marked "SURVEYS COMPLETED BY INDUSTRY".

If this does not necessitate the stenographer's full time, she can help in making up Forms 7 and 9.

SECOND TABULATOR: The second tabulator takes the manila folders, containing the completed survey forms and tabulation sheets (which are filed together), from the file; checks the control card for code number and other data, and fills in forms, being responsible for Forms 5, 6 and 8. She also places the plant number and numbers of forms filled in with her initials on the outside of the manila folder. Enter the plant number in all forms, whether there is an exposure or not, to keep schedules uniform. Completion of forms should be noted on control card, with date and initials.

THIRD TABULATOR: Fills in Forms 7 and 9, and is responsible for the same. When filling in Form 7:

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## INDIANA INDUSTRIAL HYGIENE SURVEY

### ASSIGNMENT OF PLANTS

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Date	Letters Sent	Surveys Returned	Surveys Edited	Surveys Tabulated	Out of Business	Toc Small Let. Ret'd
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Number pages according to the plan on pages 81 and 82 of Bulletin No. 236.

Total exposures by plant and check this total against the exposures on Form 6. If not the same, check again, and then ask second tabulator to check her figures to see where the mistake may be.

Keep sequence of occupations the same on page 1-A as on 1, 2-A as on 2, etc.

Insert the plant number and total population even though there is no exposure present.

Keep track of similar occupations using different or slightly different names. Flace synonymous names in parenthesis over original entry and insert any other synonymous names on the back of the form, identifying by number. Occupations having the same name in different departments of the same plant will be classified together, only if duties are similar. Otherwise, specify department. Example: Foreman - foundry; foreman - carpenter shop.

Keep forms in alphabetical order.

When filling in Form 9:

Make up a Form 9 for each Form 7. Enter plant number and population exposed from Form 7. If none, note same. When there are no control measures, place 0 or check mark under each entry. This is a check for omissions. When there is no exposure, there can be no controls. Then enter a dash at the bottom under Total Persons or Exposures Controlled.

Note completion of each form on outside of manila folder, and with initials and date on control card. Remove control card to give to stenographer. Place folder on top of file cabinet when completed.

FOURTH TABULATOR: The fourth tabulator keeps library file up to date. Checks forms after completion and checks off on outside of folder, with date. (It may be best to check 2 or 3 companies in one folder at a time rather than singly.)

Keeps the industrial sheets up to date as a new industry is added and makes up new folders and guide cards as new numbers are added.

Makes note of industry name on manila folders by or under code number (to aid in finding industry). Files folders placed on top of file case by third tabulator.

GENERAL INSTRUCTIONS TO ALL TABULATORS - STENOGRAPHER: Everyone should be able to do each step if the necessity arises, but no matter which person does the transcribing, the person assigned above should be responsible for the accuracy of the step assigned to her. The surveys must not pile up at any particular point as it will delay the following steps. See that you are keeping the next person supplied with work.

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DAILY PROGRESS CHART -- INDIANA INDUSTRIAL HYGIENE SURVEY 7 ------

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WEEKLY PROGRESS CHART -- INDIANA INDUSTRIAL HYGIENE SURVEY NUMBER OF PLANTS SURVEYED WEEKLY

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SYMBOL	MATERIAL
Asb	Asbestos dust
CDA	Coal Dust - Anthracite
CDB	Coal Dust - Bituminous
Sil	Silica Dust
Ate	Silicate Dust
NOS	Non-siliceous Dust
Org	Organic Dust
Fl	Fluorides
CO	Carbon Monoxide
H2S	Hydrogen Sulphide
S02	Sulphur Dioxide
OG	Other Gases
Cl	Chlorine
As	Arsenic
Cr	Chronium
Cđ	Cadmium
Hg	Mercury
Mn	Manganese
Pb	Lead
Ra	Radium
Sb	Antimony
Se	Selenium
OM	Other metals
Lac	Lacquer and Varnishes
OS	Other Organic Solvents
Pet	Petroleum Products

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SYMBOL	MATERIAL
Oil	Oil
Pnt	Paint
ACO	Acids, organic
ACM	Acids, mineral
Alk	Alkalies
Acce	Accelerators
Ald	Aldehydes
Ani	Aniline
Ams	Anines
Chm	Other chemicals
CTP	Coal Tar Products
CN	Cyanides
Dye	Dyes
Der	Other Dermatitis Producers
Hi	Hides
Inî	Infections
AEE	Alcohols, Esters and Ethers
Ink	Ink
Med	Medicinals
ETC	Extreme Temperature Changes
НН	High Humidity
P	Phosphorus
S'lt	Salt
S	Sulphur
Ben	Benzol
HIH	Halogenated Hydrocarbons

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## INDIANA BUREAU OF INDUSTRIAL HYGIENE

### CONTROL MEASURES

	CODE		MEANING
l.	POS		POSitive
2.	N	-	Negative
3•	LE	-	Local Exhaust
4.	ENC	-	ENClosure
5•	W•M•	-	Wet Method
6.	G•M•	-	<u>G</u> as <u>M</u> ask
7.	RESP	-	RESPirator
8.	ALR	-	<u>A</u> ir <u>L</u> ine <u>R</u> espirator
9•	PC	-	Protective Clothing
10.	OTH	-	OTHer

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#### GENERAL SUGGESTIONS

- 1. When sending in schedules to the Washington office, please place the schedules together by plant and code number.
- 2. List all State laws which may affect the results shown under the Industrial Health Data, i.e., (a) Laws or regulations in regard to sanitary facilities, such as the use of the common towel; (b) Compensation and insurance laws, etc.
- 3. List the exposure codes used with the meaning and any special interpretations.
- 4. List the industrial codes and various subdivisons with number of plants surveyed in each. When tabulations are completed, and there were only one or two plants in a subdivision, show where these plants were placed.
- 5. Check plants filed under each code number and pick up discrepancies. It will be very easy to change the tabulation sheets before they are summarized.
- 6. Check the editing, first for consistency, on Form 6, and then with Forms 4.
- 7. Check the tabulation of the control measures; in checking over the Forms 4, this has been found omitted in many cases.
- 8. Note whether there has been any specific interpretation of the manual, or change of interpretation from the manual; for example, if any type of respirator has been tabulated as a respirator, whether approved or not.
- 9. Prepare lists of trade name products with composition.
- Prepare a discussion of editing--write up your interpretation as you go along to aid when writing up reports. For example, state:
  a. When an arbitrary decision is made in regard to editing.
  - b. If a Pb exposure is always given where tetraethyl lead gasoline is used.
  - c. If more than a Pb exposure is given when type metal is used or melted.
  - d. If an SO<sub>2</sub> exposure is given with CO exposure in use of coal fires.

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